Pests
AND THEIR CONTROL
1947
JULY
VOL. 15, NO. 7
ORGAN OF THE PEST CONTROL INDUSTRY
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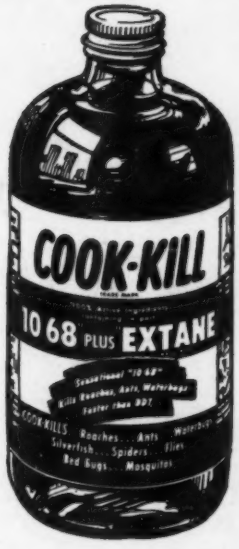

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Quarts (12 in case)	9.60	1.19 per qt.
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5 Gallons (can)	9.00	2.60 per gal.
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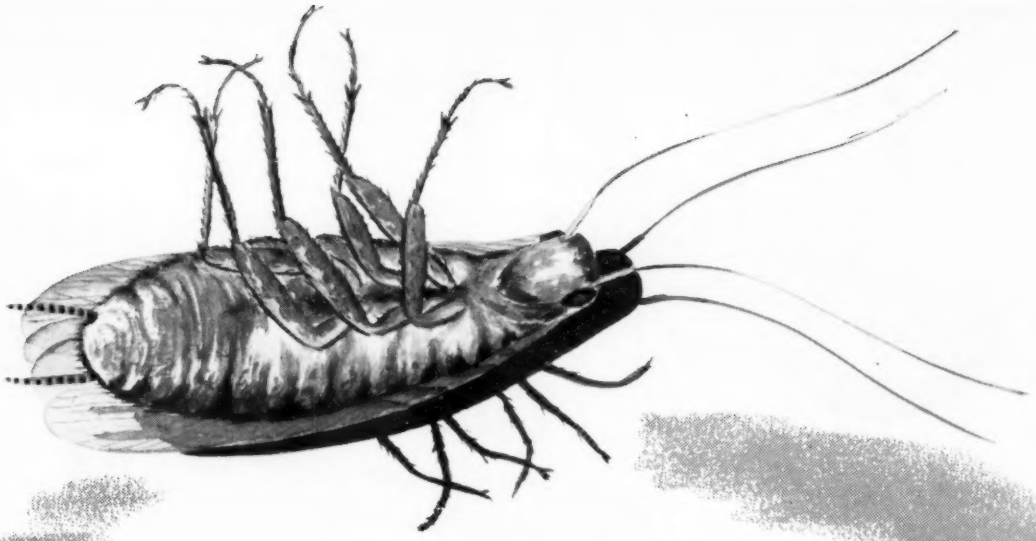

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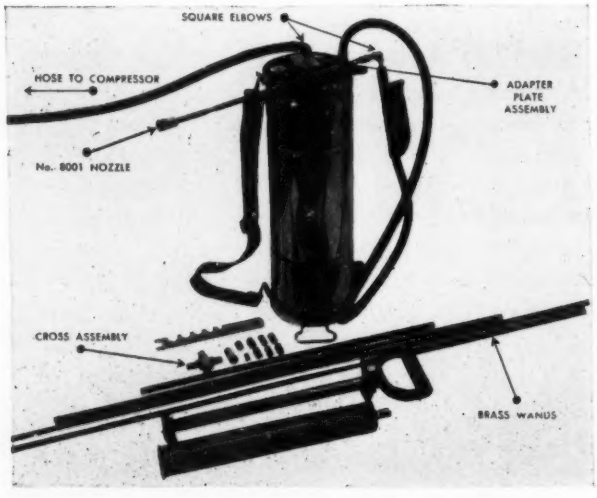

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EDITORIAL

The Importance of Key PC Service Men to the Public

THE time, we believe, has come when Pest Control Owners should think in terms of discussing with their service men and operators the high-lights of technique of application, new chemicals, and materials as well as having a clearer understanding of PC policies, standards and methods of operation than ever before.

It would be well to have these key service men attend various PCO Conferences that now take place throughout the country. It is vitally important that these men attend these meetings. They are the men who encounter pest control problems as they service various premises. They are the men who are the applicators.

While Pest Control Owners have realized the last few years the extreme importance of improving service, standards and ethics, in order to be more efficient in rendering their service to the public, let it be equally realized it may be even more important that their key service men should be in a position to know and understand the pest control problems from every single angle that it is possible to know. Only by having this knowledge will they be in a position to be more valuable to their employers.

At the recent Purdue PC Conference, one of the evening meetings was given over to "Operator Interviews", this feature serving the purpose of illustration of "good" and " bad" salesmanship, by Professor P. E. Lull, who summarized "Salesmanship" as embodying ten commandments.

The key men of any pest control business should know and remember the following splendid points at all times.

1 Know your service (and products used).

2 Know the limitations of your products or service so that there will not be excessive claims.

3 Be fair, put your "cards" on the table as far as costs are concerned.

4 Put the clients' wants, needs and desires first.

5 Be friendly.

6 Make suggestions, but don't argue.

7 Be patient, don't expect your prospect to make up his mind in fifteen minutes; he can't be expected to arrive in a few minutes at conclusions about those matters which took two years to work out.

8 Be modest.

9 Do every single thing that you promise, plus "one". (To do a little something extra will always leave a good impression.)

10 Put yourself in the prospect's position.

It would be well for all Pest Control Owners to sense the far-reaching significance and importance of having their key service men attend various PCO Conferences each year. It is to your business benefit to develop the public confidence in your service men and in your service work, and above all, in your future business.

Is The PCO Putting Himself Out of Business?

Our esteemed contemporary, "Soap and Sanitary Chemicals," poses some pertinent questions editorially in its May, 1947, issue, with reference to the future of the Pest Control Industry. Noting that "household insect spray sales last year were below normal." and that the "public generally for some time has refused to accept sprays which fail to contain DDT," the editorial logically asks "Is there a possibility that the prolonged effectiveness of these products was directly reflected in reduced sales in 1946 and may have the same effect in 1947?

Continuing in the same vein the editorial declares that where homes, cellars, attics, barns and other places were formerly sprayed at frequent intervals, the number of sprayings per season has been reduced to a small fraction of previous use due to the residual effects of DDT. Carried on for a few years, this trend could conceivably cut use of insect sprays to a point where a sizeable proportion of the industry might have to go out of business." An interesting case in point, notes the editorial, "are the results obtained, for example, in bedbug work by professional operators using DDT. They actually tend to put themselves out of business by the recent effectiveness of their control operation." In short, asks the writer of the editorial, "is the current insecticide market situation merely a temporary matter reflecting a slow season in 1946, or is it the beginning of a trend which might have permanent effects on insecticide sales?"

Few, if any, will disagree with the foregoing speculative analysis of the current situation, nor with the closing thought of the editorial "that it will take another five years to find the real answer to this question, but in the meantime, a closer study by trade groups might unearth information of value."

Meanwhile, a glance at an analogous instance or two—there are others—should prove helpful, perspectively speaking. For instance, tires produced today give infinitely greater mileage than those manufactured at the turn of the century. Has the tire industry gone out of business, as a result? Hardly. While it is true, on the other hand, that the buggy manufacturer practically disappeared with the advent of the automobile and its incomparably greater speed and mileage, it did put America on wheels and Detroit on the map.

Parallel with this revolution in transportation has come an unparalleled expansion in its need and use as an essential of our way of life. By similar token this will be true of pest control, in fact already is, taking pre-war figures as a base.

That there is need for considerable reorientation of present-day attitudes on the part of the PCO, in types of services rendered, in control techniques, possibly the inclusion of a business department non-service in nature but industry related, there is not much doubt. But that there is already manifest an awareness of this need, implementation of which has already appeared in certain quarters, there is not much doubt, either.

Flammable Dangers of Insecticide Solvents

As our industry becomes more widely recognized as an important factor in public service, it is increasingly important for PCO's to understand every hazard connected with handling the various chemicals used in their service.

There is an extreme danger that familiarity may breed contempt, especially when using chemicals daily. One may soon become so accustomed to them, that precautionary measures are soon neglected.

In the recent Service Letter on Organic Solvents issued by the NPCA there is an excellent article entitled, "Flammable Dangers of Insecticide Solvents", a reprint from the American Hotel Association Report No. 9. This article strongly emphasizes the importance of a working knowledge of these materials, and gives important counsel on what to use in certain service work. Following are a few of the sub-heads of the article, which covers thoroughly the fire hazard involved in the use of certain solvents.

"Which Methods are Hazardous? Nature of Organic Solvent Dangers, The Flash Point, Boiling Range, Toxicity, Volatility Hazard, The Explosive Hazard, Selecting Solvent and Types of Solvents."

The article closes with the following precautions to be kept in mind when handling flammable solvents.

1. Be fully acquainted with the solvent used and the extent of its hazard.
2. Always keep windows open and doors closed.
3. Be sure workers are adequately protected against fumes or skin contact with the solution.
4. Spray alternate rooms. If fire should occur this will lessen the chance of rapid spread from room to room.
5. Absolutely no smoking of any kind.
6. Disconnect all nearby electric motors. A running motor may supply disastrous sparks.
7. Always keep carbon dioxide fire extinguishers nearby.
8. Check with local fire authorities concerning laws of handling and storing flammable liquids.
9. Care should be exercised in spraying any surfaces which are harmed by liquids. Always test a small area first.

We cannot stress too much the vital importance of proper precaution being observed by all PCO's in their service work to the public.

Will You Help!

The heart-reaching plea appended below and made in a letter from Dr. Walter Heerdt, now a resident of Vienna, Austria, to William O. Buettner, secretary of the NPCA, is another grim and pathetic reminder of the war's aftermath. Doctor Heerdt, who was expelled by the Nazis during the war and almost lost his life as a result, seeks help for his hunger-stricken colleagues of the Vienna Pest Control Operators Assn. He writes, in part:

"To be sure, dear Mr. Buettner, it is hard to beg, even if it is not for yourself and in the name of humanity, but I would not have written this letter if it were not an emergency case.

"Vienna is starving. This morning's paper announced that 70 per cent of Vienna's children are undernourished.

"I can assure you that even if it should be possible to keep rations on the level of 1500 calories per day this will not alter the situation. Quite often that can not be distributed because there are no supplies, and it goes down to 800 cal. per day. Conditions are desperate and I don't see how they can be changed within the next six months or so.

"One of the directors of the Vienna Pest Control Operators Association Dr. Herman Breymesser, asked me to try and look for help. My idea is: could your Association help collectively in sending food parcels to the Vienna Association. I am sure Doctor Breymesser, would gladly take over the just distribution. His address is: Hetzgasse 42/6, Vienna III/40. I guess that about a hundred people would be involved.

"Should your Association decide favorably, I am sure you would find an organization* in New York specializing in sending such parcels to Austria, parcels with base foodstuffs preferably like fat, sugar, flour, etc., and at the same time could deliver from stocks in Austria promptly.

"You should have seen once how overjoyed, touched to tears I tell you, people are who get such parcels which, in a number of cases at least, are literally life-savers. I know, I went through that experience myself."

Readers who would like to do something about Doctor Heerdt's disinterested appeal for the victims of hunger are urged to send a check either to this publication or to William O. Buettner, c/o NPCA, 3019 Ft. Hamilton Parkway, Brooklyn, 18, N.Y. But do so, please at your earliest! Dr. Heerdt, incidently, is highly regarded and well known to many in the industry in this country.

*Care Inc., 50 Broad Street, New York, N. Y.

Your Help Needed!

With a quota of $5,000 as its share to provide relief, rehabilitation and settlement for European Jewry, the Exterminators Division of the United Jewish Appeal of Greater New York is well on its way for a successful realization of this figure, it was announced by Justin Simon, of General Exterminating Co., 26 Court St. Brooklyn, N. Y., chairman of the trade effort.

Cooperating with Mr. Simon in the industry-wide drive are Herbert Meyer, of Fumex Sanitation Co.; William O. Buettner, of Buettner Pest Control Co.; Fred L. Oberlander, of the Bond Exterminating Co.; Stefan Rohdie, of the Excelsior Exterminating Co.; and E. R. Jennings, of Guaranteed Exterminating Corp.

Mr. Simon pointed out that the United Jewish Appeal is now conducting an unprecedented campaign for $170,000,000 of which New York City has accepted a quota of $65,000,000 to meet its share of the country-wide effort. All funds raised will maintain the activities of the UJA constituent agencies in restoring European Jewry to a normal living.

Appealing to all persons and firms in the industry who have not as yet made their 1947 contribution to the United Jewish Appeal, the chairman stated: "In this crucial year, when the fate of 1,500,000 European Jews is in our hands, we in America cannot pay lip service and tragically bemoan their plight. We must give, sacrificially, so that the remnants of Israel can walk in dignity, decency and security."

Mr. Simon disclosed that the United Jewish Appeal of Greater New York now includes the Joint Distribution Committee, the American ORT Federation (which has integrated its vocational training program with that of the JDC), the United Palestine Appeal, the United Service for New Americans, the National Jewish Welfare Board, the Joint Defense Appeal of the American Jewish Committee and the Anti-Defamation League of B'nai B'rith, the American Jewish Congress and the Jewish Telegraphic Agency.

Essentials of a Municipal Rat Control Program

By THOMAS B. MURRAY, Biologist,
Division of Predator and Rodent Control, Fish and Wildlife Service, Chicago, Ill.

ANY civic or municipal group contemplating a rat and mouse control project should give careful consideration to the basic requirements for a successful program. Experience has demonstrated that a good job can be expected if the following essentials be observed.

Legal authority to enter upon private property and premises for the purpose of making inspection to determine extent of infestation of rats and mice and to enforce necessary remedial action must be the first step in a municipal rodent control project. Suitable ordinance or code should be enacted by the corporate body of the city, town and/or county setting up this authority. This ordinance or code should be sufficiently inclusive to cover all phases of a control project; survey, inspections, cleanup, sanitation, ratproofing or rat stoppage, extermination and maintenance of rat and mouse-free conditions on all premises. The city of Akron, Ohio has a model ordinance in effect, except that it may be desirable to include an additional paragraph to cover insect pests.*

A coordinating committee consisting of representatives from the main civic groups should be named by Mayor or Commissioner of Public Health to act in an advisory capacity and assist in creating group sentiment in favor of the project.

This committee should meet periodically to consider work programs and become informed of current progress. This committee serves as a clearing-house for all proposals and criticisms and helps to cushion the shocks that come with a control project.

Provisions for adequate financial support on a long time or permanent basis ought to be given thorough consideration. The cost of this service can best be set up in the regular yearly budget of the Health or Sanitation Department and carried as a "must" item. Expenditures for personal services, equipment and supplies can be kept at a minimum by utilizing existing public health and sanitation facilities and personnel in any municipality.

*Copy of Ordinance attached.

To supplement public funds it may be advisable to promote memberships in a cooperative rat control organization. This could be handled through the coordinating committee.

Within the Public Health or Sanitation Department of any sizable municipality there are generally found some inspectors or laboratory technicians who possess the qualifications required for a good rat control officer. Ability to meet and work with all groups and individuals, to "sell" the program and keep it sold and operating are the prime qualifications for the personnel who may be designated to head up and work with the rat control project. It then becomes a matter of training and teaching the local personnel the proper techniques and procedures to insure adequate and proficient control operations.

Training of local personnel can be done through on-the-job instruction, and by means of special training schools designed to meet local conditions.

Where suitable personnel is not available within the local health or sanitation units, it would be advisable to recruit some good G. I. trainees through the job placement service of the state university, agricultural colleges and Veterans Administration.

Since the control of rats and mice is tied in with sanitation and cleanup activities in any municipality, it becomes a matter of placing a rat control officer in a position where he has full responsibility for enforcing the control ordinances on private property. He should be in a position to coordinate the work of garbage and rubbish disposal and cleanup within the local health units. His duties covering abatement of rat and mouse control conditions should be chiefly confined to the enforcement of the ordinances applying to private property. Control of rats and mice on public property could be done by municipal employees working under supervision of the rat control officer.

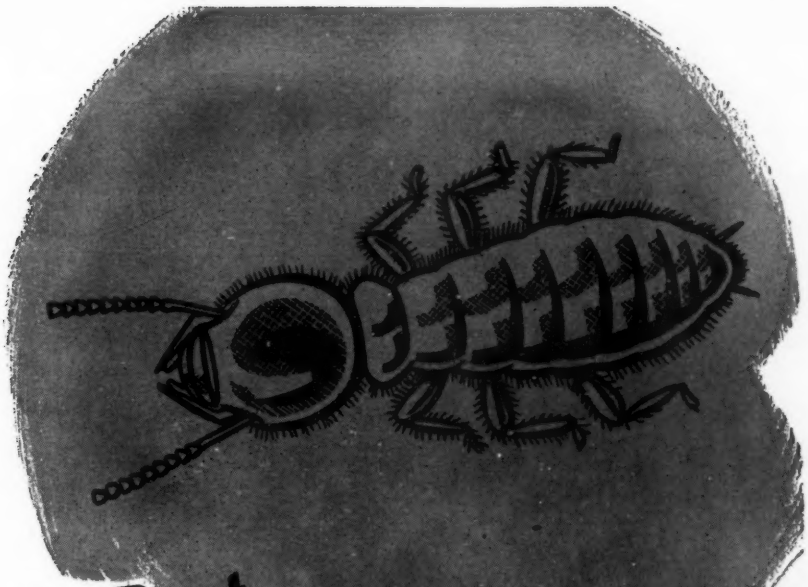
To accomplish the intent and purpose of a rat and mouse control project, a city and county-wide educational program is necessary. Neighborhood classes held at industrial plants, schools, lodges or community centers has been found effective in carrying the details of the program to all the people. Creation of a "rat-conscious" attitude and a desire to be rid of the nuisance is the aim of everyone concerned with rat control. The use of every legitimate educational means should be made an integral part of every control project.

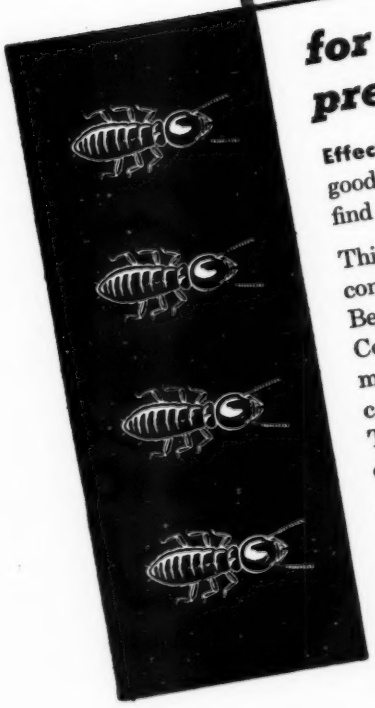
The city of Cleveland and County of Cuyahoga, Ohio, has excelled in the teaching of rat and mouse control to the people by means of industrial and neighborhood rat control schools. Poster contests in the schools, motion pictures, posters, placards, and distribution of printed circulars through neighborhood women's clubs to preserve the "personal touch" are being used in an ever-widening circle to carry the rat control message and program to all the people in Cleveland and Cuyahoga County. Newspaper publicity is coordinated with rat control schools and related activities.

As the city and county is "blanketed" with the training program, the people in the residential sections are taught to take care of their own rat and mouse control problems through sanitation, cleanup, rat stoppage, lethal baits and traps. As a means of follow-up and to give temporary relief in controlling present populations of rats, a package of red squill powder for use in mixing one pound of rat bait is distributed gratis to residents in each neighborhood who attend training schools. Additional amounts of rat baits may be purchased through local drug and hardware stores.

In the business districts throughout the city and county, all buildings and premises are checked by trained inspectors of the Food and Drug Administration, Cleveland Division of Health, cooperating with the Cuyahoga County Rat Control Organization. Where a rat infestation is found in a business building or premise, the owner or tenant is issued proper notification to clean up, rat proof, or rat-stop the premises and exterminate rats and mice. The owner or tenant can do the work himself or call in a licensed pest control operator to do this job. It is mandatory that the building and premises be maintained

BETTER TERMITE CONTROL with Du Pont SOIL COMPOUND NC





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Effective, economical, convenient to use—three good reasons why every pest-control operator will find Du Pont Soil Compound NC so valuable.

This soil poison gives longer and greater termite control than is usually expected of a soil treatment. Because it is applied dissolved in oil, Du Pont Soil Compound NC does not leach or seep with intermittent rainfall. Used crankcase oil is an excellent carrier, but kerosene or fuel oil is also satisfactory. To give effective control, only four ounces of this compound are required per cubic foot of soil.

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in a rat and mouse-free condition. Special emphasis is given to restaurants and food handling establishments.

In the Cleveland and Cuyahoga County rat control program the licensed pest control operator is definitely in the control picture. His business and usefulness is limited only by his ability to deliver satisfactory service. The total amount of business accruing to licensed pest control operators as a result of the rat control program has shown a steady increase since 1943. The actual control of rats on public property such as dumps, sewage disposal plants and parks is done by a city crew working under supervision of Mr. George C. Petry, City and County Rat Control Officer.

In fairness to Mr. E. B. Buchanan, in charge of Food and Drug Section, City Health Department, Mr. George C. Petry, Chief Food Inspector and Rat Control Officer, and an efficient staff of inspectors and office personnel, it should be pointed out that much work remains to be done before the city and county will have been covered and area control accomplished. A lot of progress has been made since the inception of the project in 1943.

The aim of this cooperative rat control project is to make Cleveland and Cuyahoga County a rat and mouse-free area by means of good public service and personal initiative. The "Cleveland Plan" may not fit the needs of all municipalities. In some sections of the country it may not work at all. For the most part the "Cleveland Plan" embodies all the essentials for a good municipal rat control project.

The technical information and supervision for the Cleveland and Cuyahoga cooperative rat control project has been supplied by the Fish and Wildlife Service, U. S. Department of the Interior, through the office of Mr. Walter W. Dykstra, District Agent, Park Square Building, Boston 16, Massachusetts. Municipalities can get additional information and assistance in planning and supervising rat and mouse control projects by addressing Fish and Wildlife Service, U. S. Department of the Interior, Merchandise Mart, Chicago 54, Illinois.

ORDINANCE NO. 2 - 1945

WHEREAS, an emergency exists in that the great number of mice and rats within the City of Akron is detrimental to the health, welfare and safety of the inhabitants of the City requiring the immediate elimination of conditions conductive thereto and therefore in order to provide for the immediate preservation of the public health, safety and welfare of its citizens, now therefore,

BE IT ORDAINED BY THE HEALTH COMMISSION OF THE CITY OF AKRON, STATE OF OHIO:

Section 1. It shall be unlawful for the owner or occupant of any premises within the City of Akron to maintain said premises in a vermin or rat infested condition or permit any such premises to become infested with vermin or rodents.

Section 2. Ratproofing of buildings hereafter required. After the adoption of this ordinance, relative to rat control, no building or structure shall be erected, repaired, altered or extended unless provision is made for ratproofing such structure.

Section 3. Par 1. It shall be the duty of the Director of Health to cause an inspection of any premises in the City which he has good reason to believe is not in a ratproof condition.

Par. 2 If such premises are found to be vermin or rat infested, a notice in writing bearing the date of issue and signed by the Director of Health, or his duly authorized representative, shall be served upon such owner or occupant. Said notice shall state the conditions of such premises and the required corrections.

Par. 3 Any such notice may be served by any employee of the Department of Health or Police or may be served by depositing the said notice, enclosed in a postpaid envelope addressed to the person to be notified, in the post office of the City of Akron.

Section 4. Owner's or Occupant's duty to remedy condition. After the owner or occupant of any such premises has been so notified by the Director of Health or his duly authorized representative, that such premises are vermin or rat infested it shall be the duty of such owner or occupant to take immediate measures to remedy the said condition.

Section 5. Injuring Ratproofing Constructions. It shall be unlawful for any person to remove, damage or destroy any part of any building or other appurtenance of improved real estate premises, intended to protect such premises against ingress of rats, or in any other way to create a condition by which ingress of rats is made possible; provided that this section shall not apply where the interference with the ratproofing is made necessary in connection with a lawful construction, promptly restored.

Section 6. No person shall throw, place or deposit or permit any person under his control or employment to throw, place or deposit any putrid substance, night soil, filth of any kind, garbage, rubbish, refuse piles, old lumber or other rat harborages or any unwholesome material, in or upon any vacant lot, alley, lane, sidewalk or street, canal, lake or river, or upon any private lot or public ground within the City without the consent of the Department of Public Service.

Section 7. Regulations for feeding wild birds. No person shall feed wild birds other than in suitable containers for the food, elevated at least forty-eight inches (48") above the ground level.

Section 8. Regulations for feeding certain domesticated fowl, birds, etc. No person shall place food in the open for the feeding of any domesticated fowl, birds or animals except in such containers as will prevent the scattering of such food upon the ground. After such feeding, such food shall not be allowed to remain where it is accessible to rats.

Section 9. Whoever violates any provision of this act, or any order or regulation made in pursuance thereof, or obstructs or interferes with the execution of such an order or wilfully or illegally omits to obey such order, shall be fined not more than $40.00. Where such violation continues after a first conviction, each day shall be deemed a separate offense.

Section 10. Each section and each subdivision of this Ordinance is hereby declared to be independent, and the finding and holding of any section or subdivision of any section thereof to be invalid or void shall not be deemed or held to affect the validity of any other section or subdivision.

Section 11. This Ordinance is hereby declared to be an emergency measure for the reasons stated in the preamble hereof and, provided it receives the affirmative vote of two-thirds of all members appointed to the Health Commission, it shall take effect and be in force immediately upon its adoption and approval by the Health Commission.

Passed May 16, 1945.

W. R. Dodd, Secretary

David Alexander
President of the Health Commission

DDT Helps Cattlemen

DDT had what seemed to a big year in 1946; but, from reports reaching the Department of Agriculture, DDT is really going into the cattle business in 1947. Last season was the first in which civilians could really make large-scale tests of the effectiveness of DDT in protecting beef and dairy cattle from the fly nuisance. Some of the results reported seem fantastic and hard to believe.

On a Kansas cattle ranch, 601 animals were sprayed three times during a sixty-day test period at the height of a bad fly season. They were compared with unsprayed animals that had to fight the flies. The DDT-sprayed animals gained 18,030 pounds more than the unsprayed animals. It took 15 pounds of DDT powder in 900 gallons of spray to do the job. The gain was 1,202 pounds of beef for each pound of DDT in the sprays. A third ranch did far better and registered more than a ton of additional beef, 2,306 pounds, to each pound of DDT.

Dairymen from several states reported that milk production held up during the fly season where a drop of from 5 per cent to 15 per cent was the rule before DDT controlled the flies.

These were good trades and meant money in the bank for the owners of the herds.

—Oil, Paint & Drug Reporter.

Air-Mail Addition?

Postoffice officials at Camp Hill, Pa., are trying to learn how a pigeon got mixed up with Uncle Sam's mail. Lewis Sutton, a postal clerk, was emptying mail sacks when the pigeon calmly fluttered out of one of them.

HELPFUL HINTS for PRACTICAL FUMIGATORS on the effective use of WESTVACO METHYL BROMIDE

No. 8 *in a Series presented as a part of Westvaco's constructive service to our friends in the Pest Control Industry. Reprints of this series will be sent without cost or obligation upon request.*

QUESTIONS & ANSWERS

on Methyl Bromide which may be included in City or State License Examinations

Q. *Is Methyl Bromide recommended for termite control?*

A. No.

Q. *Has Methyl Bromide any fungicidal properties?*

A. No. Methyl Bromide is not generally considered to be an active fungicide.

Q. *Can Methyl Bromide be used for the fumigation of raw hides?*

A. Yes.

Q. *Is Methyl Bromide suitable for fumigation of growing plants?*

A. Yes. If Methyl Bromide is used according to schedules devised by the U. S. Department of Agriculture of the State of California. It can be used to eliminate insects which are to be controlled according to the requirements of quarantine regulations. Plants as delicate as orchids have been successfully fumigated with proper dosages of Methyl Bromide.

Q. *What cold weather dosage for insect control is suggested for box-car work?*

A. Because type and condition of cars varies greatly no set schedule applies. In general 12 to 14# at 50°; 14 to 16#, 40°; 16 to 18#, 30° etc., exposure 18-24 hours.

Q. *Is Methyl Bromide recommended for control of insects in bulk grains in box cars or typical grain storages? Why?*

A. No. It has been found that the gas has a tendency to channel in its downward course through bulk grains failing therefore to diffuse thoroughly enough for overall killing action.

Q. *Does Methyl Bromide have an odor?*

A. Yes, at high concentrations. However it is not distinctive and not strong. It has been described as ether like, marshy, musty and moldy. At regular fumigation concentrations its odor is imperceptible. Never rely upon Methyl Bromide odor as a warning of its presence. Always use a gas mask of approved type when entering any space under Methyl Bromide fumigation.

Q. *What dosage and exposure period is recommended for controlling insects in box-car loads of bagged or packaged foodstuffs?*

A. Eight to ten pounds per car when the temperature is 60°F or above for an overnight period of 12 to 18 hours. Cars should not be moved after gas is applied.

WESTVACO CHLORINE PRODUCTS CORPORATION

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OCTOBER
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THIRTY
PER CENT
GREATER
COVERAGE
THAN
ANY
OTHER
ISSUE.
OF
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REGULAR
LOW
ADVERTISING
RATES
PREVAIL.
FORMS
CLOSE
SEPTEMBER
FIFTEENTH.
PESTS
AND
THEIR
CONTROL

An International Termite Exposure Test - Eighteenth Progress Report

By George M. Hunt[1] and T. E. Snyder[2]

Editor's Note: The following was presented at the Forty-third annual meeting of the "American Wood-Preservers" Association, Multnomah Hotel, Portland, Oregon, April 22 to 24th, 1947,

THIS report is the eighteenth of a series of annual progress reports on a cooperative test started in 1928 and 1929 to compare the effectiveness of various preservatives in protecting wood against decay and termite attack in various parts of the world. During August 1928 sapwood pine stakes approximately 2 inches by 4 inches by 18 inches in size were treated by the Forest Products Laboratory with 15 different preservatives and placed in service by the Bureau of Entomology and Plant Quarantine at the Barro Colorado Island (Canal Zone) test station.[3] Similar sets of test specimens were sent to Australia, Hawaii, and South Africa where they were installed by cooperating officials of the respective governments. The condition of these four sets of test stakes,[4] after 17 to 18 years' service, is shown in tables 1 to 4 of this progress report. Tables 5 to 9 show the latest inspection results on installations that have been made since August 1931 at the Barro Colorado Island (Canal Zone) test station, to include additional preservatives. These stakes have now been in test for periods of from 5 to 15 years.

The preservatives, absorptions and results, as of the most recent inspection, for each installation are given in the respective tables. These comparative data furnish useful information on the protection against decay and termite attack, provided to wood in contact with the ground by the preservatives with the absorptions used. They do not show, however, the results that might be expected with similar preservatives under less severe exposure conditions. Neither do these data show the actual life that can be expected from products, such as poles, posts and ties, that are treated with the same preservatives, especially with different absorptions. The reader is therefore cautioned to use considerable care in applying results reported.

With similar preservatives and absorptions small specimens, because of their greater surface area per unit volume and of differences in preservative distribution, do not usually perform so well as treated units of greater dimensions. Preservatives that are soluble in water do not usually perform well in contact with the ground especially under wet conditions that favor leaching. Preservative absorptions in this test are in some cases higher than those in actual use. This factor is highly important since high absorptions should furnish greater protection than low absorptions of the same preservative. Superficial applications by brushing and dipping (see tables 8 and 9), because of limited penetrations and absorptions resulting, seldom perform as well as more thorough impregnation treatments with similar preservatives. It should also be stressed that it is not safe to draw conclusions on the value of a preservative on the basis of a single test. Potential preservative users or purchasers should therefore not rely on the results of this test alone in making a comparison of various materials but should take into consideration all the other applicable information that can be obtained.

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[1]United States Department of Agriculture, Forest Service, Forest Products Laboratory. The Forest Products Laboratory is maintained at Madison, Wis., in cooperation with the University of Wisconsin.

[2]United States Department of Agriculture, Agricultural Research Administration. Bureau of Entomology and Plant Quarantine, Beltsville, Md.

[3]Now known as Canal Zone Biological Area.

[4]Detailed information on these treatments and installations can be found in the report "An International Termite Exposure Test," A. W. P. A. Proceedings, 1930, pages 318-334.

UNBIDDEN HOUSE GUESTS

by Dr. Hugo Hartnack

540 pages, 500 pictures, Weight 4 pounds.

"It is not a textbook—yet it contains a world of factual information, it is not a novel—yet it holds one's interest and supplies genuine amusement. The book covers a tremendous field. An Unbidden House Guest is considered to be any plant or animal that ventures on or within a dwelling. The scope of the material is still broader, since some of these housepests bring with them other plants and animals that cause human disease. Even if not studied, much general information can be obtained by even a casual scanning."

Price $12.00 plus 25 cents postage

TABLE 1.—CONDITION OF SPECIMENS (SET NO. 1) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 18 YEARS' SERVICE

Specimens placed in service on August 10, 1928

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption			Condition of specimens—July 1946						Average life
		Minimum	Maximum	Average	Good		Attacked		Destroyed		
		Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote	12	2.10	28.00	13.30	1	8.3	7[a]	58.4	4[a]	33.3	
Halowax[1]	7	5.20	30.80	19.10	1	14.3	1[b]	14.3	5[b]	71.4	
Zinc-meta-arsenite	8	0.58	1.17	0.78					8[a]	100.0	73
Zinc chloride	8	0.80	2.51	1.53					8[a]	100.0	22
Sodium fluoride	8	0.88	3.26	1.75					8[a]	100.0	15
Borax	8	1.03	2.92	1.85					8[a]	100.0	16
Nickel arsenate	7[d]	0.73	1.79	1.28	1	14.3	2[a]	28.6	4[a]	57.1	
Thallium sulphate	7	0.16	0.33	0.24					7[a]	100.0	42
Sodium bichromate	7[d]	0.68	3.15	1.75					7[f]	100.0	59
Sodium fluosilicate	8	0.35	1.02	0.67					8[e]	100.0	41
Nickel bichromate	7[d]	0.88	2.50	1.53			2[a]	28.6	5[f]	71.4	
Dinitrophenol	8	0.18	0.44	0.30					8[f]	100.0	32
Tanalith[2]	8	0.35	1.15	0.70					8[a]	100.0	37
Triolith[3]	8	0.31	1.17	0.68					8[f]	100.0	9
White arsenic	8	0.70	1.08	0.84					8[e]	100.0	57
Anaconda Wood Preservative[4]	4								4[e]	100.0	76
Untreated controls	4								4[e]	100.0	8

[1] Chlorinated naphthalene
[2] A fluoride-phenol-arsenic-chromium mixture
[3] A fluoride-phenol mixture.
[4] Cold treater dust, chiefly crude arsenic.

[a] By both decay and termites
[b] By decay only.
[c] By termites only.
[d] One removed and cut up for examination, hence eliminated from the test.
[e] Mostly by decay.
[f] Mostly by termites.

TABLE 2.—CONDITION OF SPECIMENS (SET NO. 2) SUBJECTED TO TERMITE ATTACK AT CANBERRA, AUSTRALIA, AFTER ABOUT SEVENTEEN YEARS' SERVICE

Specimens placed in service May 31 to July 18, 1929

Summary based on inspection data submitted by F. J. Gay and G. W. Tack, Council for Scientific and Industrial Research, Commonwealth of Australia

Preservative	No. of specimens	Absorption			Condition of specimens—August 1946						Average life
		Minimum	Maximum	Average	Good		Attacked		Destroyed		
		Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote	12	2.4	26.6	13.1	6	50.0	4[a]	33.3	2[b]	16.7	
Halowax	7	8.3	33.7	19.8			2[a]	28.6	5[c]	71.4	
Zinc-meta-arsenite	8	.57	1.20	.76			4[d]	50.0	4[e]	50.0	
Zinc chloride	8	.99	2.34	1.52					8	100.0	80
Sodium fluoride	8	.89	2.65	1.66					8[f]	100.0	54
Borax	8	1.15	2.70	1.84					8	100.0	60
Nickel arsenate	8	.85	1.76	1.29			1[d]	12.5	7	87.5	
Thallium sulphate	7	.17	.34	.24					7[g]	100.0	72
Sodium bichromate	8	.69	3.01	1.75					8	100.0	20
Sodium fluosilicate	8	.35	.89	.65					8[h]	100.0	136
Nickel bichromate	8	.91	2.39	1.58					8	100.0	12
Dinitrophenol	8	.19	.44	.30					8[i]	100.0	143
Tanalith	8	.40	1.10	.71					8[j]	100.0	128
Triolith	8	.42	1.09	.69					8[g]	100.0	155
White arsenic	8	.78	1.21	.90			3[d]	37.5	5[k]	62.5	
Anaconda Wood Preservative	2[l]										
Untreated controls	6								6	100.0	28

About one half of the specimens of most groups were tested against Eutermes exitiosus and the other half against Coptotermes lacteus until July, 1936. From August, 1936, until August, 1939, all specimens were tested against Eutermes exitiosus. From September, 1939, onwards all specimens were subjected to attack by C. lacteus.

[a] Specimens attacked by decay only.
[b] One specimen destroyed by termites and decay and one by termites only
[c] Four specimens destroyed by decay only.
[d] Specimens attacked by decay and termites.
[e] One specimen destroyed by decay only.
[f] Two specimens destroyed by decay and termites and one by decay only.
[g] Two specimens destroyed by decay and termites.
[h] Seven specimens destroyed by decay and termites and one by decay only.
[i] One specimen destroyed by termites and decay.
[j] Four specimens destroyed by termites and decay and two by decay only.
[k] Two specimens destroyed by decay and termites and three by decay only.
[l] Not tested after first year.

TABLE 3.—CONDITION OF SPECIMENS (SET NO. 3) SUBJECTED TO TERMITE ATTACK AT HONOLULU, TERRITORY OF HAWAII, AFTER ABOUT 17½ YEARS' SERVICE

Specimens placed in service on April 27, 1929

Summary based on inspection data submitted by D. T. Fullaway, Entomologist, Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Preservative	No. of specimens	Absorption			Condition of specimens—October 1946						Average life
		Minimum	Maximum	Average	Good		Attacked		Destroyed		
		Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote	12	3.20	25.20	13.2			8	66.7	4	33.3	
Halowax	7	10.00	40.20	20.7	2	28.6	1	14.3	4	57.1	
Zinc-meta-arsenite	7[a]	0.57	1.02	0.71					7	100.0	63
Zinc chloride	8	1.02	2.25	1.51					8	100.0	36
Sodium fluoride	8	1.03	2.46	1.67					8	100.0	24
Borax	8	1.20	2.66	1.87					8	100.0	27
Nickel arsenate	8	0.92	1.72	1.30	1	12.5	5	62.5	2	25.0	
Thallium sulphate	7	0.17	0.36	0.24					7	100.0	31
Sodium bichromate	8	0.74	2.98	1.77					8	100.0	26
Sodium fluosilicate	8	0.36	0.88	0.64					8	100.0	50
Nickel bichromate	8	0.97	2.35	1.60					8	100.0	69
Dinitrophenol	8	0.19	0.43	0.30					8	100.0	36
Tanalith	8	0.47	1.09	0.72					8	100.0	38
Triolith	8	0.44	1.06	0.70					8	100.0	27
White arsenic[2]	8	0.78	1.16	0.97					8	100.0	39
Anaconda Wood Preservative[3]	3								3	100.0	30
Untreated controls	4								4	100.0	21

[1] Both decay and termites at work. A few specimens removed for decay only but mostly for termite attack or combined attack by termites and decay. At the 1944 inspection, termites were very active. Most of the specimens remaining in test contained decay and also surface termite attack but the attack was generally only 1/16 to 1/8 inch deep.
[2] Arsenious acid powdered.
[3] Cold treater dust.
[a] One specimen broken accidentally and eliminated from the records.

TABLE 4.—CONDITION OF SPECIMENS (SET NO. 4) SUBJECTED TO TERMITE ATTACK AT PIENAAR'S RIVER EXPERIMENT STATION, TRANSVAAL, SOUTH AFRICA, AFTER MORE THAN 17 YEARS SERVICE

Specimens placed in service October 2, 1928

Summary based on inspection data submitted by Malcolm H. Scott, Division of Forestry, Union of South Africa

Preservative	No. of specimens	Absorption			Condition of specimens—June, 1946						Average life
		Minimum	Maximum	Average	Good		Attacked		Destroyed by termites[a]		
		Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote	11[b]	4.30	24.50	13.30			9[c]	81.8	2[d]	18.2	
Halowax	6[b]	11.40	42.10	21.10			4[c]	66.7	2[f]	33 3	
Zinc-meta-arsenite	7[b]	0.54	1.23	0.77					7[f]	100.0	136
Zinc chloride	8	1.02	2.24	1.53					8	100.0	12
Sodium fluoride	7[b]	1.05	2.39	1.67					7	100.0	28
Borax	8	1.25	2.51	1.84					8	100.0	18
Nickel arsenate	8	0.95	1.66	1.29					8	100.0	108
Thallium sulphate	7	0.18	0.38	0.24					7	100.0	23
Sodium bichromate	8	0.79	2.91	1.77					8	100.0	46
Sodium fluosilicate	7[b]	0.37	0.88	0.64					7	100.0	33
Nickel bichromate	7[b]	0.99	2.30	1.59					7	100.0	29
Dinitrophenol	7[b]	0.19	0.42	0.30					7	100.0	60
Tanalith	7[b]	0.48	1.02	0.73					7	100.0	58
Triolith	7[b]	0.45	1.05	0.70					7	100.0	48
White arsenic[g]	8	0.76	1.17	0.90					8[f]	100.0	97
Untreated controls	4								4	100.0	19

Note: After the inspection of September 3, 1934, all the remaining specimens of this test were moved to a new location 6 miles from the original.

[a] When 50 percent or less of a specimen remained it was classed as deatroyed.
[b] One specimen pilfered, therefore eliminated from the experiment and the number of specimens in test reduced accordingly.
[c] Six specimens by decay only, three by decay and termites.
[d] One contained decay.
[e] By decay only in 3 specimens and by decay and termites in 1 specimen.
[f] By decay and termites.
[g] Arsenious acid.

TABLE 5.—CONDITION OF SPECIMENS (1931 SERIES) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 15 YEARS SERVICE

Specimens placed in service August, 1931

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption of preservative				Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote (Grade 1—A.W.P.A. specifications)	8	Oil	5.2	8.7	7.0					8[a]	100.0	120
Coal-tar creosote (Grade 1—A.W.P.A. specifications)	8	Oil	11.5	14.9	13.6	2	25.0	4[d f]	50.0	2[a]	25.0	
10% coal-tar creosote—90% petroleum (by volume)	8	Mixture	4.7	10.0	6.5			1[b]	12.5	7[c]	87.5	
10% coal-tar creosote—90% petroleum (by volume)	8	Mixture	12.7	16.8	14.2	6	75.0	2[b]	25.0			
25% coal-tar creosote—75% petroleum (by volume)	8	Mixture	5.0	9.8	7.0					8[c]	100.0	67
25% coal-tar creosote—75% petroleum (by volume)	8	Mixture	12.6	16.0	14.0	6	75.0	1[b]	12.5	1[a]	12.5	
50% coal-tar creosote—50% petroleum (by volume)	8	Mixture	5.4	8.5	7.1	2	25.0	3[d g]	37.5	3[d]	37.5	
50% coal-tar creosote—50% petroleum (by volume)	8	Mixture	10.4	17.3	14.5	6	75.0	2[b]	25.0			
75% coal-tar creosote—25% petroleum (by volume)	8	Mixture	6.1	8.5	7.2	1	12.5	2[b]	25.0	5[c g]	67.5	
75% coal-tar creosote—25% petroleum (by volume)	8	Mixture	10.1	19.3	14.8	4	50.0	4[b]	50.0			
Petroleum	8	Oil	5.5	9.8	7.0			2[a]	25.0	6[a]	75.0	

[a] By decay and termites
[b] By decay only.
[c] Decay in 4 specimens.
[d] Decay in 2 specimens.
[e] Decay in 3 specimens.
[f] 2 specimens contain decay only.
[g] 1 specimen contains decay only.
[h] Decay in 5 specimens.

TABLE 5.—CONDITION OF SPECIMENS (1931 SERIES) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 15 YEARS SERVICE (Continued)

Specimens placed in service August, 1931

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption of preservative				Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Petroleum	8	Oil	12.3	16.8	14.4	3	37.5	2[b]	25.0	3[a]	37.5	
Shale oil (crude)	8	Oil	5.2	8.5	6.7					8[f]	100.0	35
Shale oil (crude)	8	Oil	11.6	16.3	13.9			2[f h]	25.0	6[d h]	75.0	
Shale oil (distillate)	8	Oil	5.5	8.7	6.9					8[e]	100.0	39
Shale oil (distillate)	7	Oil	11.8	20.3	13.9	1	14.3	1[a]	14.3	5[c]	71.4	
Water-gas tar	8	Oil	5.5	9.3	7.2	1	12.5	1[b]	12.5	6[a]	75.0	
Water-gas tar	8	Oil	11.4	17.8	14.6	2	25.0	3[f i]	37.5	3[f i]	37.5	
Cannel-coal oil	8	Oil	6.2	7.8	7.0					8[e]	100.0	59
Cannel-coal oil	8	Oil	10.9	16.1	13.4	3	37.5	1[a]	12.5	4[a]	50.0	
1.3% beta naphthol—98.7% alcohol (by weight)	8	$C_{10}H_7OH$	.31	.44	.36					8[f]	100.0	18
2.6% beta naphthol—97.4% alcohol (by weight)	8	$C_{10}H_7OH$	.52	.79	.69					8[d]	100.0	20
3% beta naphthol—10% pine oil—87% petroleum (by weight)	8	Solution	4.8	9.2	6.8					8[e]	100.0	58
3% beta napthol—10% pine oil—87% petroleum (by weight)	8	Solution	9.5	23.7	15.8	2	25.0	2[b]	25.0	4[g]	50.0	

[a] By decay and termites.
[b] By decay only.
[c] Decay in 4 specimens.
[d] Decay in 2 specimens.
[e] Decay in 5 specimens.
[f] Decay in 1 specimen.
[g] Decay in 3 specimens.
[h] One specimen contains decay only.
[i] Two specimens contain decay only.

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TABLE 5.—CONDITION OF SPECIMENS (1931 SERIES) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 15 YEARS SERVICE (Continued)

Specimens placed in service August, 1931

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens		Absorption of preservative			Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
5% beta naphthol in an oil mixture	8	Oil	7.0	9.2	8.0					8[b]	100.0	94
5% beta naphthol in an oil mixture	8	Oil	11.4[c]	19.5	14.8					8[f]	100.0	118
Pine oil	8	Oil	5.8	9.0	7.5					8	100.0	18
Pine oil	8	Oil	11.5	21.6	14.3					8	100.0	24
Spirittine chemically treated pine oil	8	Oil	6.4	7.5	6.9					8[e]	100.0	87
Spirittine chemically treated pine oil	8	Oil	11.0	19.1	13.9					8[h]	100.0	65
Spirittine wood preservative[1]	8	Oil	5.5	9.3	7.0					8[i]	100.0	70
Spirittine wood preservative[1]	8	Oil	10.6	20.0	13.8			2[a]	25.0	6[f]	75.0	
Termite oil No. 1[2]	8	Oil	6.2	8.7	7.3					8[d]	100.0	40
Termite oil No. 1[2]	7	Oil	12.2	17.2	14.5			3[a]	42.9	4[g]	57.1	
Termite oil No. 3[2]	8	Oil	4.5	6.0	5.3					8[k]	100.0	31
Termite oil No. 3[2]	8	Oil	8.4	12.7	10.4					8[b]	100.0	92
4.8% dinitrochlorobenzene—95.2% petroleum (by weight)	8	Solution	3.8	9.5	6.5	1	12.5			7[a]	87.5	
4.8% dinitrochlorobenzene—95.2% petroleum (by weight)	8	Solution	9.8	20.4	14.8	5	87.5	1[a]	12.5	2[f]	25.0	
9.1% dinitrochlorobenzene—90.9% petroleum (by weight)	8	Solution	3.4	11.9	6.8			1[b]	12.5	7[a]	87.5	

[1] Pine tar derivative.
[2] Pine oil derivative.

[a] By decay and termites.
[b] By decay only.
[c] Decay in 5 specimens.
[d] Decay in 2 specimens.

[f] Decay in 1 specimen.
[g] Decay in 3 specimens.
[h] Decay in 6 specimens.
[i] Mostly by decay.
[k] Decay in 7 specimens.
[l] Decay in 4 specimens.

TABLE 5.—CONDITION OF SPECIMENS (1931 SERIES) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 15 YEARS SERVICE (Continued)

Specimens placed in service August, 1931

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens		Absorption of preservative			Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
9.1% dinitrochlorobenzene—90.9% petroleum (by weight)	8	Solution	11.9	18.9	14.8	5	62.5			3[a]	37.5	
5% dinitronaphthalene—95% petroleum (by weight)	8	Solution	4.5	9.6	7.4	2	25.0	1	12.5	5[d]	62.5	
5% dinitronaphthalene—95% petroleum (by weight)	8	Solution	9.7	20.6	14.3	4	50.0	1[a]	12.5	3[a]	37.5	
9.5 and 10% dinitronaphthalene—90 and 90.5% petroleum (by weight)	8	Solution	5.0	9.3	7.0					8[d]	100.0	50
9.5 and 10% dinitronaphthalene—90 and 90.5% petroleum (by weight)	8	Solution	10.2	20.1	13.7	4	50.0	2[b]	25.0	2[f]	25.0	
1.3% tetrachlorophenol—98.7% alcohol (by weight)	8	C_6HCl_4OH	.29	.44	.38					8[b]	100.0	40
2.6% tetrachorophenol—97.4% alcohol (by weight)	7	C_6HCl_4OH	.70	.79	.75					7[e]	100.0	74
4.8 and 5% tetrachlorophenol—95 and 95.2% petroleum (by weight)	7	Solution	5.8	9.9	7.1					7[a]	100.0	44
4.8 and 5% tetrachlorophenol—95 and 95.2% petroleum (by weight)	8	Solution	10.5	16.6	13.8	6	75.0	1[a]	12.5	1[a]	12.5	
9.1% tetrachlorophenol—90.9% petroleum (by weight)	8	Solution	4.6	10.7	7.3	1	12.5	1[b]	12.5	6[e]	75.0	

[a] By decay and termites.
[b] By decay only.
[c] Decay in 5 specimens.
[d] Decay in 2 specimens.
[e] Decay in 4 specimens.

[f] Decay in 1 specimen.
[g] Decay in 3 specimens.
[h] Decay in 6 specimens.

TABLE 5.—CONDITION OF SPECIMENS (1931 SERIES) SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 15 YEARS SERVICE (Continued)

Specimens placed in service August, 1931

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens		Absorption of preservative			Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
9.1% tetrachlorophenol—90.9% petroleum (by weight)	8	Solution	10.8	19.0	14.1	6	75.0	2[a][f]	25.0			
4.9% carbazole—95.1% petroleum (by weight)	8	Solution	5.9	8.8	7.0					8[e]	100.0	50
4.9% carbazole—95.1% petroleum (by weight)	8	Solution	11.6	18.3	14.3	5	67.5	3[d][f]	37.5			
9.2 and 10% carbazole—90.8 and 90% petroleum (by weight)	8	Solution	6.3	8.7	7.1			1[a]	12.5	7[e]	87.5	
9.2 and 10% carbazole—90.8 and 90% petroleum (by weight)	8	Solution	11.4	17.3	13.5	1	12.5	2[a][f]	25.0	5[e]	62.5	
6% Ac-Zol[4] solution (by volume)	8	Solution	23.6	32.8	28.0			6	75.0	2[a]	25.0	
10% Ac-Zol[4] solution (by volume)	8	Solution	26.9	36.4	30.9			8[b]	100.0			
5.1% Tanalith-U[5] (by weight)	9	Salt	1.46	1.58	1.45	5	62.5	3	37.5			
No-D-K "B" (Wood-tar creosote)	8	Oil	6.1	8.5	7.0					8	100.0	37
No-D-K "B" (Wood-tar creosote)	8	Oil	12.4	18.9	14.0			1[a]	12.5	7[e]	87.5	
5.6% sodium arsenite solution (by weight)	8	Na_2HAsO_3	1.28	1.62	1.47					8[a]	100.0	50
4.6% arsenic trioxide solution (by weight)	8	As_2O_3	.84	1.56	1.33			2[a]	25.0	6[e]	75.0	
4.8 and 7.4% barium hydroxide solution (by weight)	8	$Ba(OH)_2$	1.34	1.99	1.58					8	100.0	17
2% sodium silicofluoride solution (by weight)	8	Na_2SiF_6	.36	.58	.49					8[a]	100.0	20
16.8% mono ammonium phosphate solution (by weight)	8	$NH_4H_2PO_4$	4.0	6.2	5.0					8	100.0	9
Celcure process[6] (Steamed 1 hour after treatment)	8	Solution	26.5	31.0	29.5	6	75.0			2	25.0	
Celcure process[7] (Steamed 1 hour after treatment)	8	Solution	21.0	33.0	28.3	8	100.0					
Celcure process[6]	8	Solution	24.1	31.4	28.3	5[b]	62.5			3[a]	37.5	
Celcure process[7]	8	Solution	25.8	31.0	29.1	7	87.5	1	12.5			

[4] Copper-zinc-phenol mixture.
[5] Fluoride-phenol-arsenic-chromium mixture.
[6] 2.8% copper sulphate (crystals), 2.8% potassium dichromate, 1.3% pyroligneous acid solution, (by weight).
[7] 5.6% copper sulphate (crystals), 5.6% potassium dichromate, 2.7% pyroligneous acid, (by weight).

[a] By decay and termites.
[b] By decay only.
[c] Decay in 4 specimens.
[d] Decay in 3 specimens.
[e] Decay in 5 specimens.
[f] One specimen contains decay only.
[g] Decay in 2 specimens.
[h] Three specimens contain decay only.
[k] One specimen previously reported as attacked.

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TABLE 6.—CONDITION OF SPECIMENS TREATED WITH REILLY TRANSPARENT PENETRATING CREOSOTE AND SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 13 YEARS SERVICE

Specimens placed in service August, 1933

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption of preservative			Condition of specimens—July, 1946					
		Minimum	Maximum	Average	Good		Attacked[b]		Destroyed by termites	
					Number	Per cent	Number	Per cent	Number	Per cent
		Lb. per cu. ft.								
Reilly Transparent Penetrating creosote[1]	8	7.4	9.2	8.6			6	75.8	2[c]	25.0
Reilly Transparent Penetrating creosote[1]	8	11.5	12.8	11.9			8	100.0		
Reilly Transparent Penetrating creosote[1]	8	15.6	17.2	16.3			6	75.0	2[c]	25.0
Untreated controls	8								8[a]	100.0

[1] Said to be a product obtained from coal-tar creosote by a refining process that removes most of the coloring matter, and to which a volatile solvent has been added as a carrier.
[a] Average life less than 3 months.
[b] Attack mainly by termites working gradually inward from surface. Many specimens in bad condition and all contain some decay.
[c] By decay and termites.

TABLE 7.—CONDITION OF SPECIMENS (1938 SERIES) TREATED WITH SODIUM SALTS OF CHLORINATED PHENOLS AND WITH OTHER PRESERVATIVES AND SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 8 YEARS' SERVICE

Specimens placed in service, September 1938

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption of preservative (dry salt)			Condition of specimens—July 1946						Average life
		Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
					Number	Percent	Number	Percent	Number	Percent	
		Lb. per cu. ft.									Months
Permatox 7S[1]	10	.24	.28	.26					10[b]	100.0	83
Permatox 7S[1]	10	.45	.54	.50	1	10.0	8[a]	80.0	1	10.0	
Permatox 7S[1]	10	.69	.81	.75	1	10.0	6[a]	60.0	3[a]	30.0	
Permatox 7S[1]	10	.92	1.06	.98	3	30.0	7[a]	70.0			
Sodium tetrachlorophenate	10	.24	.27	.25					10[c]	100.0	57
Sodium tetrachlorophenate	10	.47	.56	.51			9[b]	90.0	1	10.0	
Sodium tetrachlorophenate	10	.70	.83	.76			9[b]	90.0	1[a]	10.0	
Tanalith-U	10	.18	.22	.20					10	100.0	35
Tanalith-U	10	.28	.33	.30			2[d]	20.0	8[f]	80.0	
Tanalith-U	10	.53	.66	.60			10[b,i]	100.0			
Zinc chloride	10	.44	.53	.47					10[i]	100.0	46
Zinc chloride	10	.70	.82	.76					10[b]	100.0	47
Zinc chloride	10	.95	1.08	1.00					10[g]	100.0	47
Zinc chloride	10	1.40	1.62	1.49			3[c]	30.0	7[g]	70.0	
Chromated zinc chloride	10	.45	.55	.49					10[b]	100.0	59
Chromated zinc chloride	10	.70	.81	.76			4[b]	40.0	6[b]	60.0	
Chromated zinc chloride	10	.94	1.11	1.02			1[b]	10.0	9[b]	90.0	
Permatox 7S[1] plus sodium chloride[2]	10	.52	.55	.54			6[b]	60.0	4[a]	40.0	
Untreated controls	10								10	100.0	8

[1] Sodium pentachlorophenate.
[2] Absorption based on sodium pentachlorophenate only.
[a] One specimen contains decay.
[b] All contain decay.
[c] Three specimens contain decay.
[d] Two specimens contain decay.
[e] Four specimens contain decay.
[f] Five specimens contain decay.
[g] Six specimens contain decay.
[h] Decay in all but one specimen.
[i] Four specimens contain decay only.
[j] Seven specimens contain decay.

TABLE 8.—CONDITION OF SPECIMENS (1940 SERIES) TREATED WITH BOLIDEN SALT AND OTHER PRESERVATIVES, AND SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER NEARLY 6 YEARS SERVICE

Specimens placed in service September 1940

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	No. of specimens	Absorption			Condition of specimens—July 1946						Average life
		Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
					Number	Percent	Number	Percent	Number	Percent	
		Lb. per cu. ft.									Months
Dry salt											
Zinc chloride	10	0.47	0.51	0.49					10[a]	100.0	36.4
Zinc chloride	10	0.93	1.07	1.01					10[a]	100.0	42.7
Zinc chloride	10	1.34	1.58	1.49			1[a]	10.0	9[a]	90.0	
Boliden salt[1]	10	0.31	0.35	0.33			9[b]	90.0	1[a]	10.0	
Boliden salt[1]	10	0.41	0.46	0.44	6	60.0	4[c]	40.0			
Boliden salt[1]	10	0.54	0.62	0.58	10	100.0					
Boliden salt[1]	10	0.72	0.82	0.78	10	100.0					
Boliden salt[1]	10	0.97	1.11	1.05	10	100.0					
Oil											
Coal-tar creosote	10	3.2	5.4	4.3	9	90.0	1[a]	10.0			
Coal-tar creosote	10	6.5	9.6	8.0	10	100.0					
Coal-tar creosote	10	10.5	13.5	11.8	10	100.0					
Coal-tar creosote	10	14.3	19.0	16.5	10	100.0					
Coal-tar creosote (dip)[2]	10	1.0	2.8	1.8	1	10.0	1	10.0	8	80.0	
Coal-tar creosote (brush)[3]	10	0.32	0.97	0.76					10[d]	100.0	30.0
Untreated controls	10								10[d]	100.0	13.5

[1] Absorption based on total anhydrous salts: $ZnSO_4 + H_3AsO_4 + Na_2HAsO_4 + Na_2Cr_2O_7$.
[2] Soaked in coal-tar creosote for 15 minutes at 82 deg. F. temperature.
[3] Two thorough brush coats of coal-tar creosote applied at room temperature.
[a] By decay and termites.
[b] Two by decay only, five by decay and termites.
[c] One by decay only, three by decay and termites.
[d] One specimen contained decay.

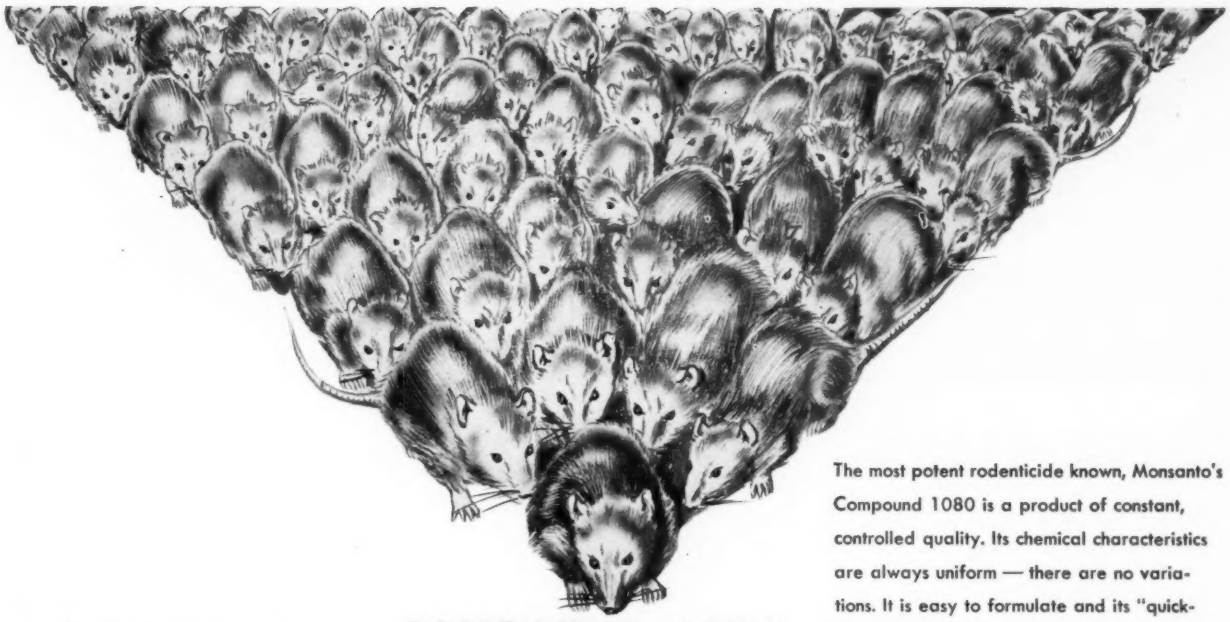

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TABLE 9.—CONDITION OF SPECIMENS (1941 SERIES) TREATED WITH SOLUTIONS OF PENTACHLOROPHENOL, SODIUM SALT OF PENTACHLOROPHENOL, AND OTHER PRESERVATIVES AND SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 5 YEARS

Specimens placed in service February 1941

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	Method of application	No. of specimens	Absorption of preservative			Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Dry Salt												
Permatox 7S[1]	Pressure	10	0.23	0.27	0.25			6[a]	60.0	4	40.0	
Permatox 7S[1]	Pressure	10	0.31	0.34	0.33	2	20.0	8	80.0			
Permatox 7S[1]	Pressure	10	0.47	0.55	0.51	5	50.0	5	50.0			
Permatox 7S[1]	Pressure	10	0.73	0.81	0.77	7	70.0	3	30.0			
Permatox 7S[1]	Pressure	10	0.92	1.09	0.99	7	70.0	3[a]	30.0			
Permatox 7S[1]—sodium chromate ratio 3.24 to 1	Pressure	10	0.41	0.47	0.44			9	90.0	1	10.0	
Permatox 7S[1]—borax, ratio 1 to 2	Pressure	10	0.71	0.80	0.75			10	100.0			
Permatox 7S[1]—borax, ratio 1 to 3	Pressure	10	0.91	1.06	0.98			10	100.0			
Permatox 7S[1]—borax, ratio 1.0 to 0.76	Pressure	10	0.54	0.62	0.58	9	90.0	1	10.0			
Permatox 7S[1]—borax, ratio 1 to 1.52	Pressure	10	0.78	0.88	0.83	2	20.0	8[b]	80.0			
Permatox 7S[1]—borax, ratio 1 to 2.27	Pressure	10	1.00	1.19	1.09	2	20.0	8	80.0[a]			
Permatox 7S[1]—borax, ratio 1 to 1.50	Pressure	10	1.17	1.32	1.25	8	80.0	2	20.0			
Solution												
Permatox A[2]	Pressure	10	4.0	5.4	4.7	3	30.0	7[b,c]	70.0			
Permatox A[2]	Pressure	10	8.6	10.5	9.6	10	100.0					
Permatox A[2]	Pressure	10	14.0	16.5	15.3	8	80.0	2	20.0			
Permatox A[2]	Pressure	10	18.6	21.5	20.1	10	100.0					
Permatox B[3]	Pressure	10	4.2	5.8	4.9	2	20.0	8	80.0			
Permatox B[3]	Pressure	10	9.1	10.9	10.0	2	20.0	8	80.0			
Permatox B[3]	Pressure	10	14.2	16.3	15.4	10	100.0					
Coal-tar creosote	Pressure	10	3.5	6.7	4.7	7	70.0	3[b]	30.0			

TABLE 9.—CONDITION OF SPECIMENS (1941 SERIES) TREATED WITH SOLUTIONS OF PENTACHLOROPHENOL, SODIUM SALT OF PENTACHLOROPHENOL, AND OTHER PRESERVATIVES AND SUBJECTED TO TERMITE ATTACK AT BARRO COLORADO ISLAND, CANAL ZONE, AFTER ABOUT 5 YEARS (Continued)

Specimens placed in service February 1941

Summary based on inspection data submitted by James Zetek, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

Preservative	Method of application	No. of specimens	Absorption of preservative			Condition of specimens—July, 1946						Average life
			Minimum	Maximum	Average	Good		Attacked by termites		Destroyed by termites		
			Lb. per cu. ft.			Number	Percent	Number	Percent	Number	Percent	Months
Coal-tar creosote	Pressure	10	8.4	11.6	10.0	8	80.0	2	20.0			
Coal-tar creosote	Pressure	10	13.5	15.4	14.4	10	100.0					
No. 2 fuel oil	Pressure	10	8.2	11.9	9.9			4	40.0	6[b]	60.0	
No. 2 fuel oil	Pressure	10	18.2	21.0	19.4			7	70.0	3	30.0	
Permatox A-2[4]	3-min. dip	10	0.5	1.4	0.8					10[b]	100.0	32
Permatox A-2[4]	18-hr. soaking	10	2.1	2.6	2.4			10[b]	100.0			
Permatox A-3[5]	3-min. dip	10	0.7	1.2	0.9					10	100.0	40
Permatox A-3[5]	18-hr. soaking	10	2.3	3.7	2.8			10	100.0			
Permatox A-3[5,6]	18-hr. soaking	10	1.1	3.0	2.3			6[b]	60.0	4	40.0	
Permatox B-2[7]	3-min. dip	10	0.9	1.6	1.2					10	100.0	28
Permatox B-2[7]	18-hr. soaking	10	2.5	4.0	3.1			9[a]	90.0	1	10.0	
Permatox B-4[8]	3-min. dip	10	0.5	0.9	0.8					10[b]	100.0	19
Permatox B-4[8]	18-hr. soaking	10	2.1	5.8	3.4			2	20.0	8	80.0	
Untreated controls		10								10	100.0	15

[1] Sodium pentachlorophenate.
[2] Pentachlorophenol, 5 percent solution in No. 2 fuel oil.
[3] Pentachlorophenol, 3 percent plus 2-chlororthophenylphenol 2 percent in No. 2 fuel oil.
[4] Pentachlorophenol, 5 percent, dissolved in 50-50 mixture of No. 2 fuel oil and Stoddard solvent.
[5] Pentachlorophenol 5 percent, dissolved in No. 2 fuel oil, Stoddard solvent and soybean oil, ratio 45 to 45 to 5, respectively.
[6] Specimens contain both heartwood and sapwood
[7] Pentachlorophenol 3 percent, 2-chlororthophenylphenol 2 percent, dissolved in 50-50 mixture of No. 2 fuel oil and Stoddard solvent.
[8] Pentachlorophenol 3 percent, 2-chlororthophenylphenol 2 percent, dissolved in mineral spirits plus moisture repellent.
[a] Two specimens contain decay.
[b] One specimen contains decay.
[c] Mostly decay in 4 specimens.

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Sanitary Control in Food Industry

By A. G. MACNAB, Sanitary Inspector, City of Westmount, Quebec, Canada

PERSONAL hygiene and habits of individuals in the Food Industry have now been established as being of tremendous importance in disseminating or preventing the spread of Communicable Disease. Fifty years ago about the only persons who ate in Dining Rooms were Commercial Travellers, and in those days eating out was not considered a satisfactory way of enjoying a meal. These groups of travelling men did not relish eating out, but they had no opportunity to change this procedure, except perhaps to carry sandwiches.

Communicable disease in those days was also important, and persons were made ill from partaking of foods which were contaminated, but in this modern age, when more than half the population "eat out" every day, many more persons are absent from business, because of improper methods used by Restaurant Operators. It is therefore, recognized that restaurants and the Food Industry mean much more than keeping the premises clean. It must also mean preventing the spread of Communicable Diseases.

There are many important requirements in the Food Industry, the first being that each individual care for his health and keep well; secondly, safe, clean practices in serving, preparing, or manufacturing of food; thirdly, the correct way to wash, handle, and store equipment, fourthly, recommendations for preparing, serving and protecting food against flies, fleas, roaches, vermin and other forms of contamination.

It is first necessary for a food handler to know about and become conscious of his own health habits. All of us require a dependable body to enable us to carry out our daily task to the best of our ability. The first consideration must be a medical check-up annually. From a Doctor's viewpoint the human body is a complicated instrument. It's worth looking after, as there are no replacements or spare parts. You owe it to yourself, to your employer, your community, and your country to give it every care. Therefore, be moderate in your undertakings, eat a normal amount of dairy products, bread, meats, green vegetables and fruits, see your Dentist regularly, bathe frequently and get at least eight hours of sleep daily. Learn not to over indulge and over exert, be careful and particular in your personal habits; then and only then can one enter into the food industry ready to play a very important part in Public Health.

Safe Clean Practices

The habits of individuals have not changed; so there always will be several groups who have certain unsatisfactory methods in the Food Industry. There are others who will be amenable to new ideas, and it is this group that we are giving every assistance by conducting educational classes in an effort to raise the general standard and thereby reduce the number of persons who become ill from food poisoning or Communicable diseases.

The first fundamental principle in the Food Industry, therefore, must be personal cleanliness. In spite of all the preventative measures enforced by Health Authorities, it is realized that accidental contact with contaminated objects, or with persons who are carriers of disease, are responsible for a large but undetermined number of Communicable Diseases.

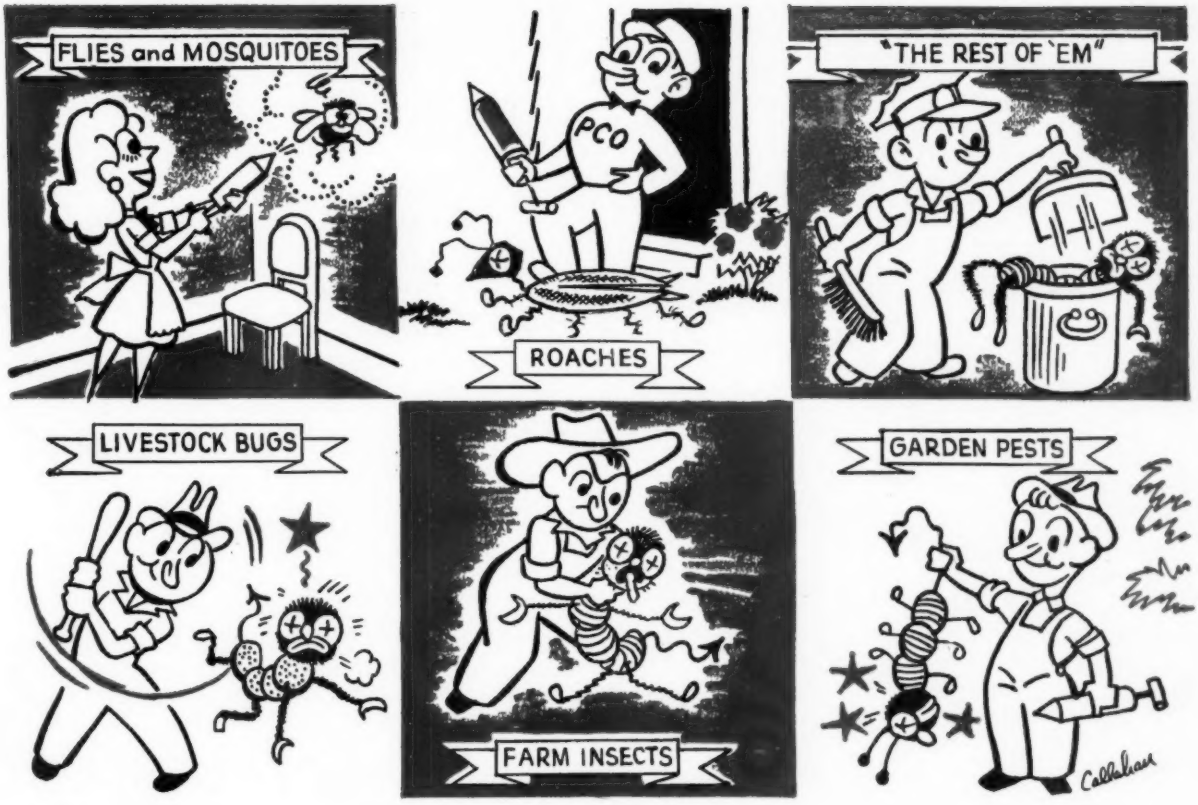
Many of our foods in the Food Industry serve as an excellent media for the growth of certain disease-producing bateria. This should be brought to the attention of the food handlers by acquainting them with outbreaks in the community or other communities, explaining their cause and how to prevent them, as well as explanations of the care to be taken in preparing, storing and the correct methods of dispensing of such foods. In preparing foods which will require heating, sufficient heat must be maintained to kill off any of the bacteria which may be present. Foods not intended for immediate consumption must be kept cold in the Refrigerator, as many outbreaks of food poisoning result from lack of correct refrigeration. Refrigerators at correct temperatures prolong the time during which all perishable foods may safely be kept, and also affords protection against contamination by dust and insects. The temperature of refrigeration necessary must be uniform and near freezing to prevent multiplication of bacteria. In a meat refrigerator 38 degrees - 40 degrees F., Fish Refrigerator 33 degrees F., Dairy Products Refrigerator 40 degrees F., seem to be suitable temperature for the various food products.

Refrigeration

Refrigerators however have their limitations and these are not always appreciated by food handlers lacking knowledge of bacterial activity. Cold storage cannot render a food safe once it has been infected by harmful bacteria. It must be remembered that refrigerators are not sterilizers and any bacteria that may have infected food when out of the refrigerator will only be rendered inactive when returned to the refrigerators. The film of moisture caused by the "thawing out" of frosted foods actually provides a more suitable medium for bacterial activity than a dry surface. Foods which are infected do not necessarily appear different, nor is there an odour to indicate the presence of bacterial activity. Many persons in the Food Industry look for signs of spoilage, such as decay fermentation, bad odour and moulds, but all these signs may be absent and yet the food be very dangerous if ingested. Bacteria like insects and human beings have to eat to survive, but because of their microscopic size a number of persons wish to ignore their presence. It's a question of "Hear no evil, See no evil, and Speak no evil". This misconception is unfortunate, as bacteria eat and multiply rapidly at room temperature. They also give off waste matter in the form of a toxin, and this toxin when ingested with food is what makes us sick. It is therefore, very apparent that perishable foods rerequired to be refrigerated at a suitable temperature already mentioned and actual danger may be caused by expecting too much protection from a Refrigerator, and thereby bring a useful modern appliance to disrepute. Refrigerators therefore do not sterilize food, but only prevent multiplication of bacteria.

Food Poisoning

One of the most common organisms causing food poisoning is the Staphylococcus called "Staph" for short. They can be found most everywhere, but more particularly in the nose, mouth or hands of persons.



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To cite a particular case of food poisoning; during the butter shortage, some Restaurants were mixing Butter, Cottage Cheese and Mayonnaise together to make the butter quota "stretch out". One of the Chefs in one store three or four days previous to mixing these ingredients accidently cut his finger. He kept band aids on but the band aids were wet most of the time. Eventually a slight infection was started without his knowledge. He unsuspectingly made above mixture with his bare hands about 3 hours before meal time and left the mixture at room temperature in a bowl. This was done purposely in order that the mixture would be easy to apply to rolls or sandwiches. The result was several persons were reported having the usual symptons of food poisoning, nausea, vomiting and diarrhoea. Eventually the offending "staph" was traced to the Butter Mixture, and also isolated from the infected finger of the chef who made the mixture.

Germs therefore like all dishes made from eggs, meat, poultry, dressings, creams, custards, soups, etc., and if the temperature is to their liking, not too cold and not too hot, they multiply again and again. Foods for consumption, therefore must be kept cold in the Refrigerator, or hot, on the stove or on a steam table.

Dish Washing

Much time and money have been spent on the inspection, preparing and storing of the food being prepared for human consumption. All of this will be lost if the method of handling or unclean habits recontaminate the food. It has been clearly demonstrated on many occasions that bacteria are present on dishes and utensils which have been improperly washed. This phase of catering to the community cannot be overstressed and education along these lines would certainly be of the first consideration.

Dish washing is one of the most important functions in the Food Industry. Food can be recontaminated by improperly washed dishes and utensils or improper handling by a person whose hands carry organisms of Communicable Disease through poor personal habits. To mention a few, Chicken Pox, Influenza, Measles, Pneumonia, Trench Mouth, Common Cold and Whooping Cough. Perhaps the Infantile Paralysis virus may be also transmitted in this manner. Some of the above diseases have been the cause of transmitting from person to person either directly or indirectly.

Proper Dish Washing methods therefore are vitally important. Three or four steps are very essential to obtain perfect results. Scraping the residue from plates returned from Dining Room is the first procedure. After rinsing, the dishes are stacked ready for washing, rinsing and sterilizing. To the dishwater (temperature 140° F.) an amount of dish washing compound should be added which has a sufficient amount of free alkali present. This can be determined by a Phenophthalein Indicator. The amount of free alkali must always be maintained to clean dishes. Dishes should be rinsed thoroughly in clean hot water then sterilized in water about 180° F. for at least two minutes, and no towelling is necessary to dry dishes. Care must then be taken to store dishes to protect them against contamination.

Vermin

The control of flies, roaches and rats in the Food Industry in the past was not given very much consideration by the Operator of a Food Establishment. The insecticides used and the various combinations of repellants and vermicides were not used correctly, with varying fair results, and means also of applying were to a large extent unsatisfactory. Some insecticide manufacturers were also to blame for the fair results obtained as once the product was sold, the follow-up to check was not completed. Today this picture has completely changed, we in Health Departments are behind you all the way, as we are also behind the manufacturers of disinfectants, deodorizers, paper cups, sterilizing agents, soaps and dish washing machinery. The new stable insecticides, also the automatic electric spraying machines, have definitely assured to Food Establishments the control of pestiferous insects. The ordinary house fly, from a Public Health viewpoint, is one of the greatest carriers of disease, as his environment from the time he emerges from the egg until he ultimately meets an untimely end, is to be found in any fermenting or putrefying matter. As his structure is such that he has ability to carry disease germs on his person and everything he alights on becomes contaminated, he very definitely does not receive the credit due to his filthy habits. The common insects associated with the Food Industry are content with eating food, but they also walk all over it and therefore spoil the remainder. The fly particularly is a gregarious eater, and because of his gastronomical habits and his method of absorbing food, regurgitation to a degree, and defacation take place frequently, but because of the dimensions of the insects such acts are not observed, and even today in the hundreds of thousands of homes throughout the country flies are to be found. A great deal of education is necessary particulary in organized groups and more particularly in Schools by visual education, by the Local Health Departments or P. C. Operators through School Boards, to teach them how to prevent flies in homes and establishments and what to do to eliminate them once they have gained admittance. One of the most common faults in the Food Industry from the Public Health and pest control operators' point of view is the position of the various tables, drain boards, sinks, refrigerators, and cupboards. In our experience they are all too close together and too near the wall with the result that food scraps eventually find a permanent location between tables, cupboards, etc. The very small spaces behind sinks, refrigerators, etc., are mostly inaccessible and in some instances are covered over with monel metal or stainless steel, making ideal breeding places for roaches. The P. C. Operators can assist in no small degree by demonstrations and explanations with association of Hotels and Restaurants. The shining stainless front in a Restaurant is not a true indication of its sanitary conditions, it is what is behind that counts. The presence of rats and mice in Food Establishments has also caused several cases of food poisoning of Salmonella Enteritidis. One paticular outbreak of food poisoning involving 208 cases and 3 deaths was apparenly caused by infected rats which had contaminated a cooked cream filling for baking products. It is therefore, a Public Health problem and the P. C. Operators can practice Public Health to assist in controlling contaminated foods in the Food Industry. It is therefore, imperative first, that all Food Establishments be rat proofed, second, the foods being prepared, manufactured or stored must be stored in refrigerators if perishable, or in closed-in cupboards or containers to protect them; third, good housekeeping must then be exercised and, lastly, any vermin in the premises must then be systematically destroyed.

Practice Public Health

Standards in the Food Industry will undoubtedly become higher. It will become increasingly important for workers in the Food Industry to acquire more knowledge in the practice and preventive measures against contamination of foods. As the general public is becoming more health

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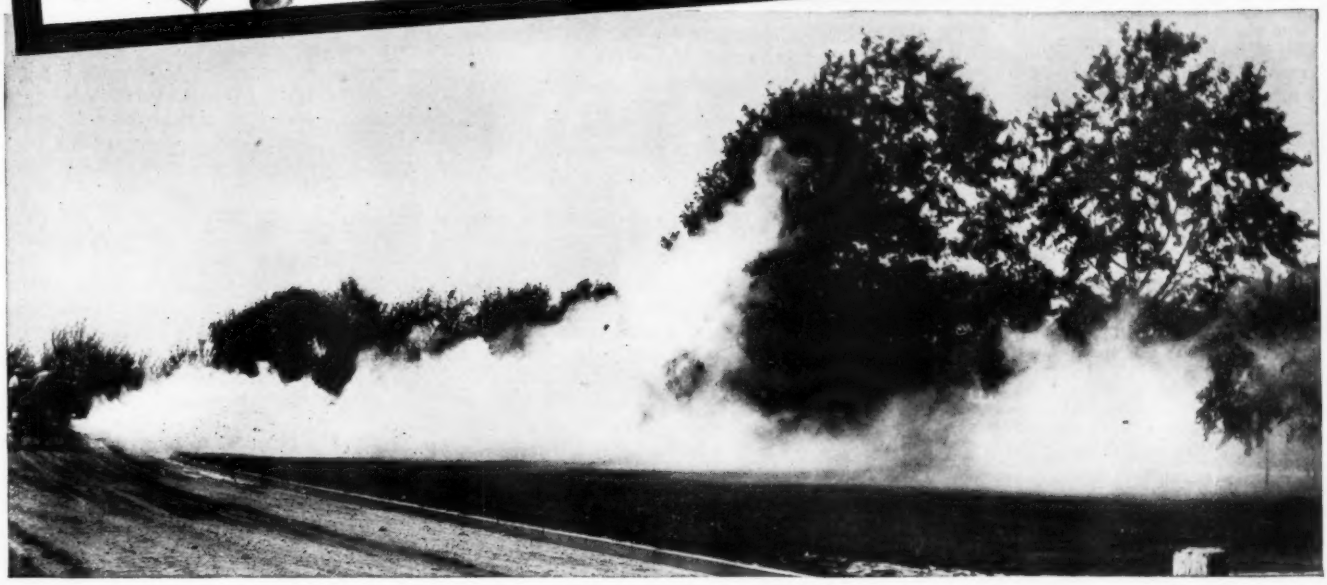

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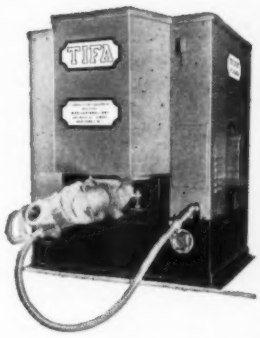

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conscious each year it will be more difficult to satisfy the customers of tomorrow. So every one of us can and must play his part, the manufacturers of various commodities used in the Food Industry can practice public health, and this assistance will be greatly appreciated by the local Departments of Public Health.

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Suppose you have decided that longer copy will better accomplish the job you have set for your advertisement. You work against your own purpose if you don't make it look as inviting as its length and the amount of your space permits. Here are a few suggestions offered by Schwab & Beatty, a New York Advertising Agency:

Paragraphs—Short. Indented, not flush. Double-lead between each.

Copy Blocks—Not too wide for proper eye range in relation to type size. Graduation of type size starting with larger, dropping to smaller.

Subheads—Frequent and bold enough to break up any too formidable appearance of body matter. Consider use of a short introductory display subhead.

Type Size—As large as is consistent with copy length you have decided will best accomplish your ultimate purpose. If your copy **holds interest** people will read much smaller type, (thus enabling you to use more of your most telling salese angles) than you may ever have imagined!

White Space—Some amount of it will help you get attention. But every **unnecessary** line of it deletes good copy which is more likely to gain your objective than will the white space it has replaced.

Art Work—Not for mere decoration, but to advance or substantiate your story pictorially.

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HOUSE FLIES

By DR. L. HASEMAN, University of Missouri
Columbia, Missouri

WHEN house flies are mentioned one naturally thinks of the disease-carrying common domestic fly which breeds largely in stable manure and in other decaying plant materials. This fly is world-wide in distribution and by far the most important single species found about the house on foods and in other places where they are a real menace to human health. However, we now have an almost perfect solution for this fly in the form of DDT applied when they alight on treated surfaces and also where used about their breeding places in barns and manure piles.

But the species of fly recently found so abundant in homes and about which readers of **Pests** may be interested to know is entirely different, it is commonly called the "cluster-fly" from the fact that it tends to collect in groups or clusters, often containing a thousand or more flies. Several homes in northeast Missouri, school houses and other buildings recently have been fairly over-run by this fly. Some have reported hundreds, and even in some cases several thousand of them suddenly showing up on the windows in some houses. Most of our complaints about this fly have come from a small area in northeast Missouri.

This fly is slightly larger than the common house fly, but can readily be mistaken for it. It belongs in a different group, however, from the one to which the house fly belongs. It is a close relative of the blow flies or green flies and is close to the notorious screwworm flies. It is a sluggish fly, is not attracted to foods in the home and usually clusters in darkened spots about the house. Usually it emerges in the fall and comes into houses to pass the winter, but recent complaints we have received seem to indicate that they have been entering houses during the last month. However, because of their habit of hiding away in out-of-the-way places in buildings during the winter months to come out of hibernation in the spring, it is possible that at least many of them may have spent the winter in hiding in the buildings. Be that as it may, during the last month they have been annoying people in their homes and pupils and teachers in school buildings due to their unusual numbers on windows and their buzzing sound.

This fly is of European origin and was brought to this country sometime before the middle of last century. It is now widely scattered in this country but is known to be abundant only in scattered areas and then not every year. Where it appears in annoying numbers in homes and other buildings use DDT as for controlling the common house fly. Earlier workers were unable to determine just where it bred and what its maggot stage fed on, though they assumed that manure and similar materials were eaten by the maggots. It is known technically as **Pollenia rudis,** the cluster fly, and according to C. W. Sabrosky of the U. S. Department of Agriculture, Division of Insect Identification, its maggot is a parasite of earthworms, the species **Helodrilus rosens** being its favorite earthworm host in this country.

Such being the case we may expect it to appear in greatest numbers coming into homes in seasons and in regions where for any reason these earthworms are especially abundant. With the recent rains in central Missouri, earthworms and their signs of activity in surface soil have appeared in unusual abundance so these flies should find plenty of earthworm hosts for their brood of maggots this spring. The writer would appreciate reports from any readers of **PESTS** who may have recently found this fly in buildings and on windows in great numbers.

It's Not Your Eyes, Mesh Is Different

New York—If your new wire window screens look a little different this summer, don't blame your eyesight. Those tiny mesh openings really are rectangular, not square, say screening manufacturers.

Much of this year's output of flame-resistant metal screening will be 18x14 mesh, a new type with oblong openings. However, the openings may be longer but they are also narrower—so the mosquito still won't be able to get in.

Man Mistook Poison For Sugar

Adelaide—Bevan Williams 25, who had been spraying poison to eradicate fruit-fly accidentally poisoned himself at lunch-time.

Williams mistook granulated poison for sugar and stirred several spoonfuls into his tea.

He became violently ill and was rushed to Adelaide hospital.

—*Sunday Post, Sydney, Aus.*

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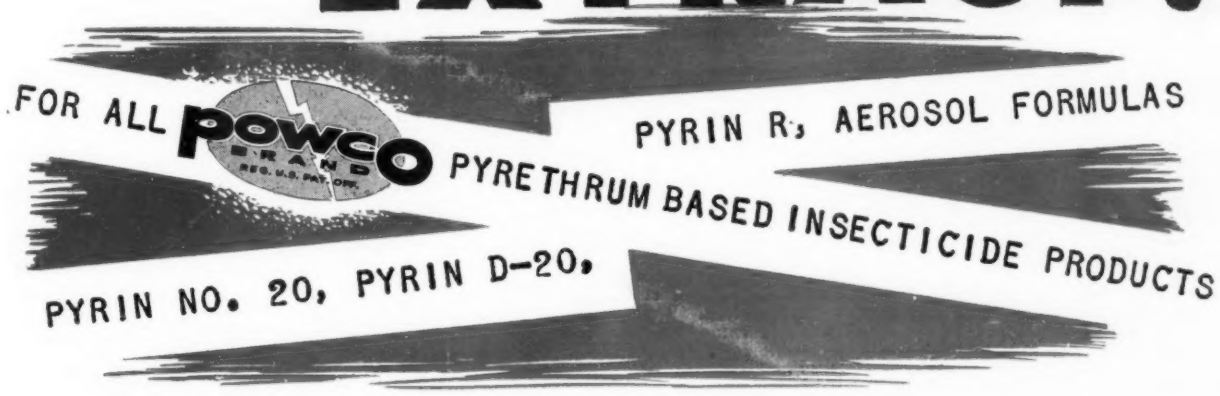

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The Poets' Hymenoptera: Part I - The Honeybee*

By C. R. TWINN, Ottawa, Ontario, Canada

Introduction

THE ORDER Hymenoptera is a large one comprising more than 60,000 described species and many others not yet known to science. It includes insects with four membranous wings, of which the second pair are smaller than the first pair and are attached to the latter by a row of chitinous hooks. The mouthparts of hymenopterous insects are primarily adapted for biting, but also for sucking and lapping liquid food. The female ovipositor is modified for various purposes: for stinging, as in the bees and wasps; piercing, as in parasitic forms such as the ichneumons, and sawing, as in the destructive sawflies. The order includes the most highly developed of social insects: the ants, the bees and the wasps, the former of which have long been objects of study and popular interest, and have been frequently held up to man as models of industry and order. An example of this is to be found in Pope's **Essay on Man** (III)

"Thus then to man the voice of nature spoke—
Go, from the creatures thy instructions take:

* * * * *

Thy arts of building from the bee receive;
Learn of the mole to plough, the worm to weave;

* * * * *

Learn each small people's genius, policies,
The ants' republic, and the realm of bees;
How those in common all their wealth bestow,
And anarchy without confusion know,
And these forever, though a monarch reign,
Their sep'rate cells and policies maintain,
Mark what unvaried laws preserve each state,
Laws wise as Nature, and as fixed as fate."

Although some forms of hymenoptera notably the sawflies and the horntails are destructive to crops and trees, other forms are highly beneficial. The bees fertilize flowers and store honey, and numerous species of parasites and predators reduce or control noxious insects.

**Part I of this paper concerns the honeybee; Part II will relate to bumble bees, ichneumons and gall wasps, and Part III to wasps and hornets. The ants have already been dealt with* (3).

The Honeybee

"Thise flyes that men clepeth bees"
—Parson's Tale: Chaucer

The honeybee, or **Apis mellificia L.**, to give its scientific name and avoid confusion with other species, belongs to the family Apidae and shares with the silkworm moth the distinction of being one of the greatest insect benefactors of the human race. Man was probably familiar with the bee and its honey while still a nomadic hunter. Certain it is that the bee developed a complex social life long before mankind lived together in civilized communities. Less than two hundred years have elapsed since cane sugar became available to the masses. For many centuries before that happy development man was largely dependent on the honeybee for his sweets. Little wonder than that he was greatly concerned for the bee's welfare, and provided it with homes to hive in under his protection, in place of the perhaps hard-to-find hollow trees, or cavities in rocks, which were its natural shelter in the wild state. Poets, philosophers, naturalists, and the average man have all shown a keen interest in the honeybee and its works, and have recorded their emotions, thoughts, and findings in numerous parchments and publications over the the centuries, so that now it is perhaps the best known of all the insects. The information handed down was not always correct, especially from the ancients, the facts sometimes being mixed with strange fictions or superstitions, which persisted for many hundreds of years.

Samson appears to have originated the old superstition that bees sometimes hive in the carcasses of dead animals. It is recorded in **Judges** (XIV: 8-10) that when returning to Timnath for the Philistine woman of his choice, he "turned aside to see the carcase of the lion" (which he had slain on his previous visit): "and, behold, there was a swarm of bees and honey in the carcase of the lion. And he took thereof in his hands, and went on eating, and came to his father and mother, and he gave them, and they did eat: but he told not them that he had taken the honey out of the carcase of a lion." On this basis he sent the Philistines a riddle which they only solved with the connivance of his bride and with dire consequences to her and to themselves. The riddle was: "Out of the eater came forth meat, and of the strong came forth sweetness." And the answer the Philistines gave was "What is sweeter than honey? and what is stronger than a lion?"

It has been suggested that what Samson saw were drone flies (Syrphidae), which are often mistaken for bees and may be seen about decaying matter. This of course would not explain the presence of honey. Catlow (1, p. 288) says that: "it must be remembered that some months had elapsed before Samson's second visit to the scene of his exploit, ample time, in that country, with the assistance of birds and beasts of prey, to reduce the carcase of the lion to a perfectly clean skeleton, in which state it would form an appropriate habitation for these little insects."

In the poem **The Bees and the Flies**, Rudyard Kipling describes the experience of one poor farmer who believed a legend sufficiently to put it to the test.

"A farmer of the Augustan Age
Perused in Virgil's golden page,
The story of the secret won
From Proteus by Cyrene's son—
How the dank sea-god showed the swain
Means to restore his hives again.
More briefly, how a slaughtered bull
Breeds honey by the bellyful.

"The egregious rustic put to death
A bull by stopping of its breath,
Disposed the carcass in a shed
With fragrant herbs and branches spread,
And, having thus performed the charm,
Sat down to wait the promised swarm.

"Nor waited long. The God of Day
Impartial, quickening with his ray
Evil and good alike, beheld
The carcass—and the carcass swelled.
Big with new birth the belly heaves
Beneath its screen of scented leaves.
Past any doubt, the bull conceives!

"The farmer bids men bring more hives
To house the profit that arrives;
Prepares on pan, and key and kettle,
Sweet music that shall make 'em settle;
But when to crown the work he goes,
Gods! what a stink salutes his nose!

"Where are the honest toilers? Where
The gravid mistress of their care?
A busy scene, indeed, he sees,
But not a sign or sound of bees.
Worms of the riper grave unhid
By any kindly coffin lid,
Obscene and shameless to the light,
Seethe in insatiate appetite,
Through putrid offal, while above
The hissing blow-fly seeks his love,
Whose offspring, supping where they supt,
Consume corruption twice corrupt."

Shakespeare, too, knew of this ancient belief and apparently had some doubts as to its accuracy, for in **2 Henry IV** (IV. 4), he put into the mouth of the king, who feared that his son would not forsake his bad companions, the words:

"'Tis seldom when the bee doth leave
her comb
In the dead carrion."

There are many references to honey as a food in the Bible. A familiar one is in **I Samuel** (XIV:24-27), which occured during Saul's battle with the Philistines:

"Saul had adjured the people, saying, 'Cursed be the man that eateth any food until evening, that I may be avenged on mine enemies.' So none of the people tasted any food. And all they of the land came to a wood and there was honey upon the ground. And when the people were come into the wood, behold, the honey dropped; but no man put his hand to his mouth; for the people feared the oath. But Jonathan heard not when his father charged the people with the oath; wherefore he put forth the end of the rod that was in his hand, and dipped it in an honeycomb, and put his hand to his mouth; and his eyes were enlightened."

Another reference is to be found in **Matthew** (III: 4) concerning "John the Baptist, preaching in the wilderness of Judea. And the same John had his raiment of camel's hair, and a leathern girdle about his loins; and his meat was locusts and wild honey." The locusts of course were grasshoppers.

*Contribution No. 2448, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

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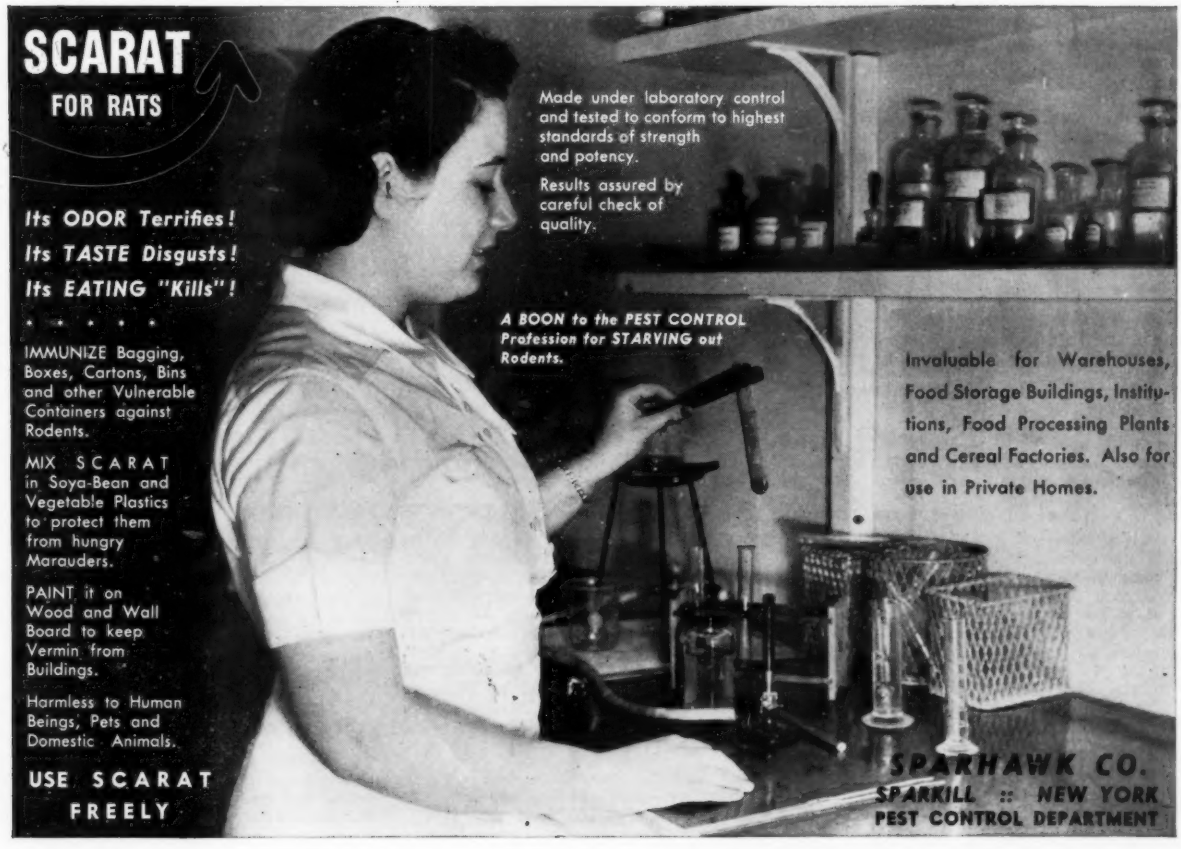
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There are several varieties of honeybees inhabiting different regions, and one of these, the Egyptian, which occurs in North Africa and Arabia is said to sting furiously and be easily aroused. It may have been this variety that Moses referred to in **Deuteronomy** (1: 44) when he pointed out to the Israelites that they ignored the Lord's warning given through him, and went against their enemies in the hills:

"And the Amorites, which dwelt in that mountain, came out against you, and chased you, as bees do."

The psalmist in **Psalm 118** also sang of his enemies that "They compassed me about like bees".

The sting of the bee is usually inflicted by the workers in defence of the hive. The drone is stingless, and the queen rarely uses her sting except to dispatch rival queens. There seems to have been a wholesome appreciation of the stinging powers of the bee among the poets. In Shakespeare's **2 Henry VI ,III: 2),** when the Earl of Warwick learns that Humphrey, Duke of Gloucester, has been murdered, he says to the king:

"The commons, like an angry hive of bees,
That want their leader, scatter up and down,
And care not who they sting in his revenge."

And in **Titus Andronicus** (V. 1):

"Be bold in us: we'll follow where thou lead'st
Like stinging bees in hottest summer's day
Led by their master to the flower'd fields."

Shakespeare was wrong in indicating that bees have a male leader. Actually, the workers carry out the defence of the hive and visit the fields entirely on their own, but more of that anon. Edmund Spenser recorded in **Epigrams** (IV:3) that "a gentle Bee, about him flew", and later, that "the Bee him stung", which rather discredited its supposed gentleness.

The early seventeenth century poet Sir John Suckling, in **A Ballad Upon a Wedding,** noted of the bride that:

"Her lips were red, and one was thin;
Compared with that was next her chin—
Some bee had stung it newly;"

thus imparting a very homely touch to the scene. Robert Burns observed the uproar that accurs when a bees' hive is disturbed and mentioned it in **Tam O'Shanter:**

"As bees bizz out wi' angry fyke,
When plundering herds assail their Eyke."

The bee's sting is not to be treated lightly for it is an excellent weapon for defence. It consists of the modified ovipositor and is barbed towards the tip, so that frequently it is left in the wound and may penerate deeper if not propmtly removed. Poison secreted by certain glands is injected into the wound from a poison sac attached to the base of the sting. The poor bee usually only stings in defense of the colony, for if the sting is torn away from her she dies shortly afterwards. This was alluded to by Tennyson, in the **Ancient Sage:**

"Nor thou be rageful, like a handled bee,
And lose thy life by usage of thy sting."

The highly developed social order of the bees is a continual scoure of wonder, and has been described by many writers. One of the most beautiful poetical descriptions, if not the most accurate, was written by Shakespeare in the play **Henry V** (I: 2). The words were spoken by the Archbishop of Canterbury:

". . . so work the honey bees;
Creatures that by a rule in nature teach
The art of order to a peopled kingdom.
They have a king, and officers of sorts;
Where some like magistrates, correct at home,
Others, like merchants, venture trade abroad,
Others, like soldiers, armed in their stings,
Make boot upon the summer's velvet buds;
Which pillage they with merry march bring home
To the tent-royal of their emperor;
Who, busied in his majesty, surveys
The singing masons, building roofs of gold;
The civil citizens kneading up the honey;
The poor mechanic porters crowding in
Their heavy burdens at his narrow gate;
The sad-eyed justice, with his surly hum,
Delivering o'er to executors pale
The lazy yawning drone."

There is, of course, no king or emperor in the bee colony, but a queen, who is the largest individual in the hive. Her function is not to rule over the colony, but to lay eggs. Usually there is only one queen to each colony, but her egg-laying capacity is prodigious, and may reach 2000-3000 per day at the height of the season. The old queen may live for several years, but she is quickly superseded by a young queen reared by the workers when she fails in egg-laying.

The "lazy yawning drone" is the male bee and his only useful functiion is mating with a young virgin queen, after which he dies. The drones do no work and consume considerable stores. Their very name connotes idleness and uselessness. Shylock, in the **Merchant of Venice** (II: 5) said of his servant Launcelot that he was unprofitable, a large eater, and lazy, and added:

"Drones hive not with me."

During the summer, the drones in a colony may become fairly numerous, but when the honey flow slows down and stops, the workers eliminate them. As the King in **All's Well That Ends Well** (1:2) put it:

"Since I nor wax nor honey can bring home,
I quickly were dissolved from my hive,
To give some labourers room."

The bee colony is made up of three castes of bees, the queen and the drones, and the workers, which comprise the bulk of the members. The merchants, soldiers, masons, civil citizens and porters mentioned in Shaperpeare's description all belong to this caste. They do all the work: feed and care for the queen and the young, construct the comb, guard the hive and keep it clean and properly venilated, gather nectar and pollen, and manufacture the wax and honey, and do anything else that has to be done. They have long been held up as shining examples of tireless industry, as witness the expression "busy as a bee". John Lvly, in **Euphues and his England** referred to a "comely olde man as busie as a bee": and Isaac Watts in **Divine Songs** Song No. 20, Against Idleness, included that well-known verse:

"How doth the busy little bee
Improve each shining hour,
And gather honey all the day
From every opening flower!"

Well might William Blake write that, "the busy bee has no time for sorrow". The bees that emerge during the summer when nectar is plentiful work continuously from sunrise to sunset. In fact, they literally work themselves to death, their average life under such conditions being only six or seven weeks. Of course, those that emerge in the autumn live longer, as they are required to carry the colony through the winter and perform the necessary labours of the following spring. John of Salisbury, Thomas Becket's friend in Tennyson's play **Becket** (V: 2: 218), evidently had a poor opinion of women as housewives, if one may judge from his remark to Becket:

"So rare the household honeymaking bee,
Man's help! but we, we have the Blessed Virgin
For worship, and our Mother Church for bride."

Up to less than a hundred years ago the beehive commonly used in England was a simple dome-shaped structure called a "skep" hive in which all the work of making the combs was left to the bees. The modern beehive is box-shaped and made of wood,. and fitted with movable trays containing frames of wax on which the bees can build their cells, thus saving them labour and increasing the honey production. The following poetical allusions are to the old picturesque skep hive. In Michael Drayton's **Nymphidia,** written more than 300 years ago, fairy King Oberon in his pursuit of Pigwiggen attacked a glowworm in mistake for a devil and:

"From thence he ran into a hive,
Amongst the bees he letteth drive,
And down their combs begins to rive,
All likely to have spoiled:
Which with their wax his face besmear'd,
And with theiy honey daub'd his beard;
It would have made a man afear'd,
To see how he was moiled."

Fortunately it was night time or King Oberon would have been badly stung unless his fairy royal state protected him. Anyhow, he must have been in a nasty, sticky mess.

Usually, especially in England, beehives are situated amid scenes of tranquil rustic beauty. The vicar of the church among the mountains, in Wordsworth's poem **The Excursion** (6: 1169), kept bees in such a place, and told his visitors that:

". . . my leisure draws
A not infrequent pastime from the hum
Of bees around their range of sheltered hives
Busy in that enclosure."

In his poem in praise of Country life, **The Wish,** Samuel Rogers (who himself lived in a splendid mansion) wrote:

"Mine be a cot beside a rill;
A beehive's hum shall soothe my ear;
A willlowy brook that turns a mill,
With many a fall, shall linger near."

The continual hum is made by the bees in their constant journeyings to and from the hive, collecting spoils from the flowers. Or, as Wadsworth expressed it in **The Soaring:**

"The roving bee proclaims aloud
Her flight by vocal wings."

This phase of the bee's activities has naturally been most frequently observed by the poets and has been mentioned in numerous poems. There is the well-known musical couplet sung by Ariel in **The Tempest** (V:I):

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24/1-pint cans or bottles	$1.20 per case*
12/1-quart bottles	1.00 per case*
24/1-quart cans	2.00 per case*
6/1-gallon cans	1.84 per case*
11/5-gallon pails	1.25 each**
55-gallon drums ($4.00 drum deposit)	.25 per gal.**
Tank Cars (F.O.B. Port Arthur, Texas; ½ freight allowed)	.18 per gal.

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"Where the bee sucks, there suck I;
In a cowslip's bell I lie."

and this piece of descriptive verse from James Thomson's **The Seasons - Spring:**

"Here their delicious task the fervent bees,
In swarming millions, tend: around, athwart,
Through the soft air, the busy nations fly,
Cling to the bud, and, with inserted tube,
Suck its pure essence, its ethereal soul;
And oft, with bolder wing, they soaring dare
The purple heath, or where the wild thyme grows,
And yellow load them with the luscious spoil."

Robert Burns, who included more than a dozen allusions to bees in his songs and poems, sang through his Willy to Philly:

"The bee that thro' the sunny hour
Sips nectar in the opening flower,
Compar'd wi' my delight is poor,
Upon the lips o' Philly."

Another musical gem from Burns is this:

"Amang the trees, where humming bees
A buds and flowers were hinging' O,"

or this from Tam O'Shanter:

"As bees flee hame wi' lades o' treasure
The minutes wing'd their way wi' pleasure."

A remarkable fact about the honeybee is the apparent organization of the workers to ensure a proper division of labour, and to prevent overlapping or duplication of activities. There also seems to be an allocation of the available territory among the workers. Furthermore, they usually collect nectar from only one species of plant during any one trip. This is of primary importance in the fertilization of the flowers, the pollen being carried from blossom to blossom on the hairy bodies of the insects. In the following, from **The Church. Providence, George Herbert wrote that:**

"Bees work for man, and yet they never bruise
Their Master's flower, but leave it having done,
As fair as ever and as fit to use;
So both the flower doth stay and and honey run."

Farmers Warned on DDT

Washington,—Congress has found out that DDT shows up in the meat, milk and butter of cows fed on crops dusted with the insecticide.

Dr. P. N. Annand, chief of the Entomology Bureau, also testified at House hearings on funds for the Agricultural Department that too much DDT might poison the soil, and that it had permitted some pests to increase because it killed the parasites which destroy them.

He said that the Food and Drug Administration, after examination of meat products, had indicated there was not enough of the DDT to cause harm to humans.

Dr. Annand said there was concern, however, over secretion of DDT in milk because it concentrated in the butterfat so that butter "may have fairly high quantities." The department, he added, was not recommending DDT for forage crops to be fed to milk cows "because of that hazard."

New Approach to Labeling Problem

By JOSEPH A. NOONE,
Member, Legislative Committee, AIFA*

Precautionary labeling of the type applied to DDT and more recently to other new organic insecticides, such as benzene hexachloride and the methoxy analog of DDT, typifies a new approach to an old problem.

The problem is to label chemicals in such a manner as to protect the user from any hazards they may offer. With the increasing number and complexity of chemicals for many economic uses, including agricultural pest control, the old "poison" label has become hopelessly inadequate.

The new approach on industrial chemicals began in 1944 whan the Manufacturing Chemists, Association organized the LAPI (Labels and Precautionary Information) Committee. This has had full support of the AIF Association.

From the beginning it was evident that to most people, "poison" means something which can be fatal when taken by mouth. In fact the statutory definition reads "liable to be destructive of human adults in doses of 60 grains or less." So a "poison" label gave no warning that it might be harmful to breathe the vapors, or inhale the dust, or spill the liquid on the skin.

Furthermore, many chemicals are not poison by that definition, are not actually toxic or hazardous but yet can be harmful in other ways. For example, repeated exposure to high concentrations of carbon tetrachloride may result in serious liver damage, a delayed toxic effect.

The LAPI Committee, after careful analysis of the hazards variously presented by ingestion, inhalation, contact, volatility and flammability, set up 10 basic classifications of hazards. Three standard signal words were adopted: "Danger," "Warning," and "Caution," in order of decreasing degree. It was agreed that a proper precautionary or warning label should use one of these words and should go on to tell, clearly and briefly, the nature and extent of any hazards present. It also should tell how to guard against the hazard, and what to do for first-aid if necessary.

Results of this study were set down in MCA Manuals L-1, "A Guide for the Preparation of Warning Labels for Hazardous Chemicals," and L-2, "Illustrative Warning Labels for Hazardous Chemicals," recently re-issued in a single volume "Warning Labels." Some typical labels from the latter are:

CARBON TETRACHLORIDE

Warning! ....Volatile Solvent
Vapor Harmful
Avoid prolonged or repeated breathing of vapor.
Use with adequate ventilation.
Avoid prolonged or repeated contact with skin.
Do not take internally.

PENTACHLOROPHENOL

Warning! Harmful Dust
Avoid breathing dust.
Avoid contact with skin or clothing.
In case of contact with dry material or its solution, wash at once with soap and plenty of water.
Do not take internally.

First sight of one of the new type labels should not frighten the user. It does not mean the material is necessarily more dangerous than many of the old familiar products.

Chemical manufacturers generally have adopted precautionary labeling as a basic policy. An increasing number of products today carry caution labels, even though their hazards are far less than those of a few other chemical products not so labeled.

Precautionary labeling is simply an honest effort to bring to the user's attention a fair statement of any hazard present, whether serious or only mild. That is how the label should be read and evaluated.

The importance and value of such precautionary information to the handler and user of economic poisons has been so demonstrated that it is required under provisions of both the proposed new Federal Insecticide, Fungicide and Rodenticide Act and the model uniform State bill. Thus, the future will see a much more widespread use of it in the agricultural field.

Some of the new organic materials present hazards of use which are unfamiliar. Rather than be disturbed by the new warning label, the user should feel satisfied that if he reads the label and heeds its message, he can go ahead in safety.

Precautionary labeling is intended to dispel ignorance and indifference relative to the hazards involved in the handling and use of chemical products and thereby reduce the possibility of accidents. It will achieve this purpose if carefully read and observed.

— AIF News

**Agr. Insecticide and Fungicide Ass'n.*

Mice In Cabin

Mice in Cabin—We have a log cabin and the inside is lined with insulating wallboard. Recently we noticed traces of mice and left some poison around, but they seemed to avoid this. They bored holes in the wallboard and nested behind it. How can I get rid of the pests? B. McC., Brooklyn.

When the cabin is closed at the end of the season, scatter about two pounds of moth balls in each room. Mice and other animals generally dislike the odor. Close up all holes and opening in the cabin walls and cap the top of the chimney with stout half-inch wire netting. Weighting the netting will hold in in place. During the summer, when house is occupied, use plenty of mouse traps. Also keep doors closed as much as possible and windows well screened.

DDT Rival Repels Flies

DDT has a rival that not only kills but repels, says **New York World-Telegram** Called NMRI 448, it was developed by the Navy. It is effective against mosquitoes, houseflies, sand flies, chiggers, bedbugs and silverfish. As a repellent, it is 2 to 6 times more effective than anything else tested anywhere. Killing faster than DDT, it is used as a spray.

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Louse Control Possibilities Promising

It should be possible for mankind to eradicate the louse as a pest of humans and carrier of disease, Federal entomologists say, on the basis of recent research results.

Discovery of new louse killing chemicals as effective as DDT or more so, and somewhat quicker in action improves the chance for world-wide louse eradication.

On the basis of the experience with DDT, Dr. E. F. Knipling, of the U. S. Department of Agriculture, who is in charge of the research on insects affecting man and animals, expresses the opinion that "more thought should be given to eradicating lice from entire communities, countries, and continents." He says, "The performance of DDT, both under controlled conditions and in practical tests on a large scale, shows that the insecticide is sufficiently effective to make such a program possible."

The new lousekillers are the best of several that emerged from "screening tests" of more than 7,500 possibilities investigated in the emergency program which the Bureau of Entomology and Plant Quarantine undertook during the war at request of the U. S. Army. Research has continued since V-J Day and further testing of some of the more promising materials is being continued along with experimental work to develop the full possibilities of DDT.

Early achievements of the research program included:

1 The methyl bromide method for fumigating and delousing clothing in the field, both in individual packages and in portable cabinets that would treat the complete kits of scores of soldiers.

2 The MYL powder, which the Army adopted for field use because it was far better than any previous louse control.

3 DDT, which superseded MYL powder because it was a "still better" control. The Army use of DDT in Naples stopped cold a spreading epidemic of typhus among civilians, and protected the U. S. Army in that and other areas.

4 DDT would be further improved, the entomologists recognized, if it worked more quickly, either as dusting powder or when impregnated in clothing. Lice may remain active up to 6 hours when exposed to 10 per cent DDT powder used in the usual ways. An insect might, in some cases, transmit disease within that time. Two highly effective materials were discovered which could be added to DDT and paralyzed the lice within 15 minutes. But both of these proved too toxic to warm blooded animals. However, continuing research showed that by adding a complex chemical to pyrethrum and adding this mixture to DDT it was possible to combine quick "knock down" by the pyrethrum with the persistent killing effect of DDT.

Five chemicals emerged from the "screening tests" of the more than 7,500 substances tested. Two of these were much better louse killers than DDT, but proved too poisonous to be safe. A third was not persistent enough, would not give protection after an impregnated garment was washed.

The two remaining louse control substances are identified by the Bureaus as Chlordane and a chlorinated camphene. Both of these are still under test, but are regarded as practical substitutes for DDT in the event that they prove safe to use on man. From experience with other insect pests, entomologists recognize that there is a possibility that the louse might develop a strain which has a tolerance to DDT treatment. This has happened in the case of one of the scale insects that attacks citrus trees and which has developed resistence to hydrocyanic acid gas poisoning. Also, strains of the codling moth resistant to arsenical sprays have developed.

Thus, from the standpoint of world-wide eradication of the louse, these recent discoveries are regarded as important. Chances for eradication are greatly improved by the fact that an anti-louse campaign might go into operation with three effective, and more or less, interchangeable—weapons, instead of a single one.

(Chlordane is classed as a chlorinated hydrocarbon. The full chemical name of chlordane is 1,2,4,5,6,7,8,8-octachloro-4, 7-methano-3a,4,7,7a-tetrahydroindane.)

Man Girds For War On Insects

By DR. FRANK THONE

War between man and the hordes of insects is taking a new turn. Man is counter-attacking.

No longer do we hear gloomy declarations that all is lost, or as good as lost, that the insects are going to wipe out mankind, and that the next great period in earth history will be the Age of Insects. Entomologists are sounding the bugles for the counter-attack.

We can lick any bug that ever straddled on six legs, they tell the world. We can wipe out any species that we want to. From now on, any little pest that survives does so only on man's tolerance, because he isn't worth the cost of the powder to blow him to you-know-where.

This is not mere cockiness; it is just plain confidence, born of knowledge that we possess new weapons against our insect foes and that new tactics have been developed for their use.

Call To Battle

Challenge to battle was laid down recently by Dr. Clay Lyle, retiring president of the American Association of Economic Entomologists. Pointing out how man has been able to inflict total defeat on several particularly evil insects by using intensive methods in limited areas, he declared that time is ripe now for a nation-wide campaign against the most familiar of pests, the common house fly.

This is not to be just a swat-the-fly drive, aiming only at abatement, at mere reduction in numbers. Its objective is the total elimination of the house fly, making it an extinct species, as dead as the dodo, at least so far as this country is concerned.

Several considerations indicate the choice of the house fly, rather than some other insect even more dangerous to man, like mosquito, or a major crop pest like the cotton boll weevil or the potato beetle. These insects breed in the open, and attacks on them might seriously upset the balance of nature by heavily harming more valuable kinds of insects and other lesser wildlife forms.

On the other hand, flies, like rats, are direct hangers-on of man: they breed and feed close to his dwellings and barns, and are seldom found at any distance from them.

General Dislike of Flies

It is easier, also, to enlist the interest of the public in an all-out attack on flies. Having learned how they revel in filth, and that they can spread diseases that lurk in filth, people generally have come to hate flies pretty much as they do rats.

A campaign to wipe out the house fly will automatically kill off its stable-mate, the horn fly. This insect is smaller but more vicious because it bites and draws blood. It torments cows endlessly in warm weather, and occasionally wanders up to the house for a bellyful of human blood.

Chief Weapon Is DDT

DDT is the prime weapon for the war of extermination on flies. Of all insect orders, the Diptera, which includes flies and mosquitoes, seem to be most sensitive to this sensational insecticide. If a fly picks up even one molecule of DDT with the nerve-endings in one foot, it is certain to die. It may stagger around for several hours, but in the end it will drop to the floor with its feet sticking up in the air.

There are other means of exterminating fies, some of which have been in use for many years.

Elimination of horses from city traffic is the principal cause of the greatly diminished numbers of flies in urban areas during the past generation. Close covering of garbage, or its chemical treatment to prevent fly eggs from hatching, is another effective means of discouraging flies.

Trail Fruit Moth

Pullman, Wash.—A search for signs of the Oriental fruit moth will be started early in Washington this year, the agricultural extension service at Washington State College has decided. Thirty-two specimens of the moth—an insect pest that has done great damage to peach and other fruit trees in the east—were found in the state in 1945.

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FOR ROACHES and RATS

SINCE 1874

J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

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Super Fluorex V, powerful insecticide powder

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Barium Carbonate, Phosphorus Paste, Rumetan, Arsenic, Fortified Red Squill Extract and Powder, Antu.

Prepared Rat Baits — convenient, ready-to-use cubes. Five different food types.

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Chicago Rat Proofing Ordinance *

**Note: The following ordinance on rat proofing has much to commend it for consideration in other cities.*

SECTION 1. Chapter 61 of the Municipal Code of Chicago is amended by inserting therein a new section to read as follows:

RATPROOFING

61-102. **Buildings To Be Ratproof:** Every building hereafter constructed within the city shall be ratproof. A ratproof building is one constructed in such manner and of such material as to prevent the ingress of rats.

SECTION 2. Chapter 99 of said Code is amended by inserting therein new sections as follows:

RAT CONTROL

99-61.1. **Rat-Stoppage.** Every building or structure within the citv shall be rat-stopped, freed of rats and maintained in a rat-stopped and rat-free condition.

The term "rat-stoppage" as used herein applies to a form of ratproofing to prevent the ingress of rats into or under buildings or other structures from the exterior or from one building or structure to another. It consists essentially of the closing of all openings in the exterior walls, ground or first floors, basements and foundations, that may be reached by rats from the ground by climbing or by burrowing, with concrete, sheet iron, hardware cloth or other types of ratproofing material impervious to rat gnawing, approved by the Commission of Buildings. Hardware cloth shall mean wire screen of such thickness and spacings as to afford reasonable protection against the entrance of rats.

The term "rat-harborage" shall mean any condition which provides shelter or protection for rats, thus favoring their multiplication and continued existance in, under, or outside a structure of any kind.

99-61.2. **Inspection Notice.** It shall be the duty of the Bureau of Housing Inspection to cause inspections of the interior and exterior of buildings or other structures to determine evidence of rat infestation and the existence of new breaks or leaks in the rat-stoppage, and when any evidence is found indicating the presence of rats or openings through which rats may enter such buildings or structures, to report such evidence to the Commissioner of Buildings, who shall serve the owner, agent, or occupant of such building or structure with written notice to abate the conditions found.

99-61.3. **Rat-Stoppage By Owner, Etc.** Upon receipt of notice in writing from the Commissioner of Buildings, the owner, agent, or occupant in charge of any building or structure specified in such notice shall take immediate measures for the rat-stoppage of such building or structure and for freeing the same of all rats, and unless said work is completed in the time specified in the notice, in no event to be less than fifteen days, or any written extension thereof that may be granted by the Commissioner of Buildings, then the owner, agent, or occupant in charge of said building or structure shall be deemed guilty of a violation of this ordinance.

99-61.4. **Maintenance.** The owner, agent, or occupant in charge of all rat-stopped buildings or structures shall maintain them in a rat-stopped condition and repair all breaks or leaks that may occur in the rat-stoppage.

99-61.5. **Unlawful To Remove Rat-Stoppage.** It shall be unlawful for the owner, occupant, contractor, public utility company, plumber, or any other person, to remove the rat-stoppage from any building or structure for any purpose and fail to restore the same in a satisfactory condition, or to make any new openings that are not closed or sealed against the entrance of rats.

99-61.6 **Structural Changes.** Whenever conditions inside or under any building or structure provide such extensive harborage for rats that the Commissioner of Buildings deems it necessary to eliminate such harborage he may require the owner or occupant in charge of any such building or structure to install suitable cement floors in basements, or to require such owner or occupant to correct such rat harborage as may be necessary in order to facilitate the eradication of rats.

99-61.7. **Dumping Prohibited.** It shall be unlawful for any person to place, leave, dump or permit to accumulate any garbage or trash in any building, structure or premises so that the same shall afford food or harborage for rats, or to dump or place on any premises, land or waterway any dead animals or waste vegetable or animal matter of any kind.

99-61.8. **Accumulations of Materials or Junk.** It shall be unlawful for any person to accumulate or permit the accumulation on any open lot, or other premises, any lumber, boxes, barrels, bricks, stones, scrap metal, motor vehicle bodies or parts, or similar materials, rubbish, or any articles of junk, which provides rat-harborage, unless the same shall be placed on open racks that are elevated not less than eighteen inches above the ground, evenly piled or stacked.

SECTION 3. This ordinance shall be in force and effect from and after its passage and due publication.

Insect Collector

A machine like a vacuum cleaner fitted in the ceiling of each room, to suck up all insects would be a great asset in every home. One in the ceiling of the kitchen, for instance, could be switched on for a few minutes, and every insect in the room would be sucked into a container. The kitchen would be kept free from flies. In the bedrooms, mosquitoes would be got rid of in the same way, the suction apparatus being left on all night. Wire doors and windows would be unnecessary. Periodically, the flies and mosquitoes would be cleared out of the containers into which they were sucked, and they could be buried in the garden and act as fertilizer. In food shops such suction gadgets could be left switched on permanently, so that every fly or insect entering the shop would be immediately sucked up.

Pied Piper's Payoff

Providence, R. I.—Providence now has an official Pied Piper. John R. West, 57, was appointed to a $1,908-a-year job as rodent exterminator for the city.

Fie, the Drooping Fly

—"The life cycle and behavior of houseflies is the subject of research at Rutgers, which seeks to ascertain how flies react to temperature, light, humidity, wind, carbon dioxide, odors and other factors. The chief problem encountered thus far has been that of raising healthy houseflies."—The New York Times.

By HOPE STODDARD

What keeps the housefly
Spry?
The slow meander
Around the chande-
Lier?
Or does
It buzz
The best
In quest
Of honeycomb
Or foam
On beer?
Which odors satisfy
The fly
And why?
Does heat or cold inspire?
Does ice or fire?
Does it, in fact,
React
To wet and dry,
To steam and dust—
The fly?
These facts we must
Give keen construing,
Since Science can tell
No fly is well—
Not **really** well—
The way we're doing.
Our aim: to tackle
Houseflies' cycle,
Measure
Their pleasure,
Requite
Their appetite,
Splurge
Their urge,
Find the dish
They wish,
The whiff
They sniff,
The wall
They crawl.
We're none too soon!
If we're to have a million,
Nay, a trillion,
Healthy, happy houseflies
Here by June!

Reprinted through courtesy, New York Times Magazine, April, 1947.

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- EITHER WATER OR OIL SOLUTION—to best suit your requirements.
- FOR LARGE OR SMALL JOBS — available in 1 and 5 gallon cans—30 and 55 gallon drums.
- THE RIGHT SOLUTION—for subterranean termites, TERRATOX Nos. 225, 235 and 245 are especially recommended for soil and Wood treatment. For control of Drywood Termites, TERRATOX No. 215 is highly effective.

OPERATORS!

Send today for TERRATOX Bulletin with application information of value to all termite control operators.

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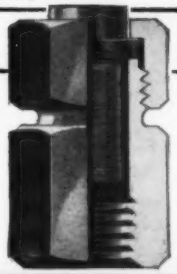

Maximum effectiveness of insecticides such as DDT depends solely on proper residual spraying. Here is the nozzle that gives you an exact and uniform distribution of the spray . . . free of streaks. An approved design available in ¼ T-8001, ¼ T-8002 and all other standard capacities.

SPECIALISTS IN SPRAY NOZZLE DESIGN AND MANUFACTURE

DDT Dust Useful for Control of Dog Ticks

DDT dust offers low-cost and practical protection against the dog tick that carries the serious disease, Rocky Mountain spotted fever, which causes deaths each season in the area east of the Rocky Mountains and in California, says the U. S Department of Agriculture.

The Bureau of Entomology and Plant Quarantine which tested this method of control last season recommends a light dusting of 10 per cent DDT powder applied to grass, weeds, or shrubs, at the rate of from 2 to 4 pounds to the acre. For small areas, such as back yards, vacant lots, and recreation grounds where children play, a dusting at the rate of one ounce to 1000 square feet would be at the rate of about 3 pounds to the acre.

Ticks are active in spring and early summer. On the basis of experience, the Bureau says that one dusting early in the season is usually all that is required, but that a second dusting may be applied if ticks are later discovered in the area.

The light dusting at the rate of about 1 ounce to 1009 square feet of area is enough for tick control, the Bureau tests indicate, and this rate is light enough so that it will not be a health hazard to children, dogs, and pets.

Additional protection from attacks by dog ticks, also commonly known as wood ticks, comes from the dusting or spraying of areas along paths and roads. The Bureau announced last year the results of studies of the habits of the ticks that showed the pests usually move toward roads or paths, probably attracted by the scent of dogs and other animals, including humans, using the road or path. Spraying or dusting along the margins of the roads not only kills the ticks where they have concentrated, but will also kill ticks entering the area for sometime after it has been treated.

The tick problem has been recognized as important for several years. The tick is a common pest and can not be eradicated completely because it attaches not only to humans and to dogs but to a wide variety of small animals such as field mice. It can carry the spotted fever virus, and mothers have been advised to make daily inspections of children who have been playing in woods or fields or have been in contact with dogs. In some areas periodic dipping of all dogs has been adopted as a safety measure. The Bureau renews its recommendation for nightly tick inspections, particularly in the areas at the edges of the hair where the ticks are most likely to be found. Tick inspection every evening is an effective safeguard because the tick does not ordinarily transmit the disease until it has been attached for five or six hours. The entomologists caution persons removing ticks to avoid crushing them. Its best to use tweezers. They say that body fluid of infected tick will transmit the disease.

DDT dusting of the areas where adults and children work and play should not cause the relaxation of other precautions against ticks, the Bureau says, but it can reduce materially the chances of attachment, and the dangers of Rocky Mountain spotted fever.

Unusual Pest Problems

By J. J. DAVIS, Purdue University

No. 27. **The Almond Moth.** An interesting problem has been reported to us by Louis L. Paul of Chicago. It again emphasizes the importance of an understanding of Entomology; first, the identity of the insect, and second, the habits and habitat of the species.

Moths were abundant in a Chicago theatre to the extent that the actors were calling them B-29s, as they flew in the spotlight. Moths were found flying about as the dust from the vacuum sweper was emptied in the boiler room, and naturally it was assumed that clothes moths were responsible.

However, Louie was skeptical and sent specimens for identification. They proved to be the almond or fig moth (**Ephestia cautella** Walker), which is a close relative of the two other common pests of stored foods, the Mediterranean flour moth (**Ephestia kuehniella** Walker) and the Indian meal moth (**Plodia interpunctella** Huebner). This species occurs throughout the world and the larvae feed on nuts, dried fruits, and similar materials.

With this information Louie proceeded to check sources of the infestation. He found foodstuffs eaten by the larvae lodged in the air-conditioning vents in the floor. Therefore those places were cleaned out, followed by frequent sprayings with a moth spray and 5 per cent DDT. As a result, the theatre is now 100 per cent free from the B-29s.

No. 28. **Carpet Beetles.** Glen Lehker reports another instance which illustrates the importance of a recognition of the insect and its habits.

Black carpet beetles (**Attagenus piceus** Olivier) were continually annoying and destructive, in spite of ordinary clean-up practices, and to the extent that Mrs. Lehker finally called on Glen to do something about it. He finally got busy, as entomologists finally do, to investigate the reason for the continual reinfestation. As a result it was found that the kitchen linoleum, which had been down for fifteen or twenty years, was the scource of the trouble. Under the edges for a distance back fourteen inches were found accumuations of lint and many carpet beetle larvae and cast larvel skins. A clean-up of this scource of infestation resulted in a complete elimination of the carpet beetle infestation.

Report of The Committee on Cooperation with Pest Control Operators for 1946*

There is a recognized need for cooperation between commercial pest control operators and technical entomologists with regard to the appreciation of mutual problems. It was on this basis that the committee was formed approximately 10 years ago. Since that time these two groups have been cooperating along the following lines:

Legislation:—The first real work of the committee had to do with the formulation of a model law for pest control operation. While a model law still hasn't been perfected, one approaching this ideal is under consideration in Florida at the present time.

Literature:—It is generally recognized that there is inadequate information with regard to the formulation of insecticides and their application, in the field of commercial pest control. This committee has been active in improving the methods of presenting literature in this field.

Education:—Education has been a very important function of this committee, and as a result of its efforts Regional Pest Control Conferences for pest control operators, have been established in the following institutions: Purdue University, 1936; West Coast Conference, The University of California, 1937; Southern Conference at Louisiana State University, 1938; Eastern Conference at Massachusetts State College, 1940; Canadian Conference at University of Montreal, 1943.

In addition to these Regional Conferences there have been many such state meetings for pest control operators, at educational institutions namely, at Rutgers University at New Brunswick, New Jersey; Michigan State College, East Lansing, Michigan; University of Florida, Gainesville, Florida; University of Wisconsin, Madison, Wisconsin; Fordham University, New York, New York; Cornell University, Ithaca, New York; University of Toronto, Toronto, Canada; and there will be a new one in 1947 at Pennsylvania State College, State College, Pennsylvania.

There have also been many state and local meetings, where entomologists and institutions have cooperated in providing their services if requested.

It is particularly notable that pest control operators are not making hit and miss insect identification, but are depending more and more upon the services of federal and state experiment station entomologists for correct identifications and aid. There has been a very definite cooperation of the National Pest Control Association by way of publicity, financial and otherwise in the promoting of additional programs. The National Pest Control Association has also offered its facilities in providing lists of respective state members to state officials, including county agricultural extension agents. These lists can be secured from the National Pest Control Association upon request.

Another interesting development in the educational field has been the establishment of a four year curriculum for pest control operation studies, at Purdue University.

Research:—There is more and more need of cooperation between research men and pest control operators in developing and supporting a sane approach to adequate control recommendations. An example was the cooperative program between pest control operators and official entomologists that occured during the war when an all-out attempt was made to determine the efficiency of DDT for the control of household and institutional types of insect pests. This type of approach to the study of a new insecticide should be seriously considered in the future. The present committee is in position to aid in such a cooperative test program.

H. A. U. Munro F. W. Fletcher
E. G. Linsley, chairman

**As presented before 58th Annual Meeting, American Association of Economic Entomologists, Hotel John Marshall, Richmond, Va., December 9-12, 1946.*

Control of Stored Food Insects with Benzene Hexachloride

Stanley J. Carpenter

Many reports have been published during recent months on the use of benzene hexachloride ($C_6H_6Cl_6$) against insects of agricultural, industrial, household and medical importance. Benzene hexachloride is now known to be even more effective against certain insects than DDT.

The writer has been interested in determining whether benzene hexachloride can be used effectively against insects affecting stored food products, and preliminary laboratory tests have already been made with this insecticide* against the following insects: **Tribolium confusum** Duv., larvae and adults **Tribolium castaneum** (Herbst), adults; **Tribolium madens** (Charp.), adults; **Gnathocerus cornutus** (Fabr.), adults; **Oryzaephilus surinamensis** (L.), adults; **Tenebroides mauritanicus** (L.), adults; **Sitophilus oryza** (L.), adults; **Attagenus piceus** (Oliv.), larvae and adults; **Dermestes vulpinus** (Fabr.), larvae and adults.

These tests were made in wooden boxes which had been lightly sprayed with the insecticide approximately one hour before the specimens were introduced. All of the specimens began showing similar reactions of distress and loss of coordination of leg movements within 10 to 15 minutes after being introduced into the boxes. Insects were generally unable to crawl up the vertical sides of the test box after 30 minutes of exposure to the treated surface and the time required for death to take place varied from 4.5 hours to 24 hours. The only significant difference noted in killing time was for **Sitophilus oryza** which was considerably longer than for other species used in the tests.

Thirty adult specimens of **Tribolium confusum** were introduced on November 25 into a test box which had been treated with benzene hexachloride on October 1. All the insects showed signs of distress and loss of coordination of leg movements within 15 minutes; after an hour none of the insects was able to crawl up the vertical sides of the box; and after 24 hours 14 were dead and the remaining 16 specimens were able to make only weak uncoordinated leg movements. 2

Adult specimens of **Oryzaephilus surinamensis** and larval and adult specimens of **Tribolium confusum** were planted in specimen boxes at different levels in a room and exposed to a smoke of the gamma isomer of benzene hexachloride. In this test, technical grade benzene hexachloride containing approximately 12 per cent of the gamma isomer was used at the rate of 50 grams per 1000 cu. feet of room space. After 24 hours exposure all the insects were alive and appeared normal.

When benzene hexachloride was used as a "smoke" the odor persisted much longer than when it was used as a spray; however, no odor or taste of benzene hexachloride carried over into bread made of flour exposed to the smoke or spray. When benzene hexachloride is used in the form of a spray in localized areas where infestations of stored food insects exist in bakeries and other food handling establishments it is not expected to be particularly obnoxious.

These preliminary tests indicate that a spray containing benzene hexachloride may possibly be used effectively against some of the common stored food insects in food processing plants and in warehouses; however, it will be necessary to conduct extensive confirmatory tests with the plants to fully evaluate it. The writer is now conducting tests with benzene hexachloride against chronic infestations of **Tribolium** spp. in bakeries.

Jour. Econ. Ent., February, 1947; *Vol.* 40 *Number* 1.

*The insecticide in these experiments contains 10 per cent of a 20 to 1 concentrate of benzene hexachloride and 5 per cent of a standardized No. 20 pyrethrum extract in deodorized kerosene. The spray contains .015 per cent of the gamma isomer.

Atomic Energy Can Chase Bugs

Apart from bombs, the discovery of atomic fission opened the way to finding out things that long have baffled chemists. Radioactive elements can act as detectives. Dr. Charles A. Thomas, president-elect of the American Chemical Society, predicted last week possible uses of radioactive tracers:

1. To find out how sap flows in dormant trees.

2. To study the efficiency of fertilizers by watching how plants pick up their "tagged atoms."

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Additional Patents Relating to Pest Control

By **DR. R. C. ROARK.**

2,410,593 (Nov. 5, 1946; appl. Sept. 4, 1945). RESPIRATORY SPRAY HOOD. Charlie Wright, Oakland, Calif. This spray hood is applicable to any case where material is sprayed, such as insecticides.

2,410,862 (Nov. 12, 1946; appl. Jan. 16, 1942). PEST CONTROL. Euclid W. Bousquet, Wilmington, Del., and Herbert G. Guy, Penn. Township, Allegheny County, Pa. E. I. du Pont de Nemours & Company, Wilmington, Del. An insecticidal and insectifugal composition contains as an essential active ingredient an aryldithiobiuret and carrier therefor. For example a water-dispersible powder prepared by milling together 80 parts of p-tolyldithiobiuret, 19 parts of Bancroft clay, and 1 per cent of the mixed higher alcohols obtained by hydrogenation of coconut oil applied to bean foliage from a 1 to 200 aqueous dispersion gave complete protection of the foliage from Mexican beetle without injury to the bean foliage. Methyl trithioallaphanate in nutrient agar resisted attack of mixed lumber molds and **Aspergillus piger** and prevented all growth of these organisms at concentrations of 1-1000.

2,410,990 (Nov. 12, 1946; appl. Dec. 8, 1942). RAT TRAP. Richard Allen Miller, Milford, Va. ....

2,410,957 (Nov. 12, 1946; appl. Nov. 3, 1944). FLY SWATTER. Henry L. Briones, East Irvington, N. Y.

2,411,064 (Nov. 12, 1946; appl. Aug. 1, 1945). 2-CHLOROALKYLIMIDE CHLORIDES. Edwin M. Shand, Munster, Ind. Sinclair Refining Company, New York, N. Y. The patentee claims 2-Chloropropionimide chloride and 2-chlorobutyroimide chloride. They are useful as insecticides and fumigants for the treatment of materials which are not adversely affected by the acid.

2,411,212 (Nov. 19, 1946; appl. May 7, 1942). APPARATUS FOR FUMIGATING BUILDINGS. Fred D. Hubbell, Baltimore, Md.

2,411,253 (Nov. 19, 1946; appl Oct. 11, 1941). PEST CONTROL. Albert L. Flenner and Norman E. Searle, Wilmington, Del. E. I. du Pont de Nemours & Company, Wilmington, Del. A parasitical composition contains as an essential active ingredient the compound having the formula R—S—X—Y in which R is a thiazole attached at the 2-position, X is a methylene radical bearing at least one hydrogen and Y represents an aliphatic substituted or unsubstituted amino radical linked through amino nitrogen to X, and a carrier therefor. An example is dodecylaminomethyl 2-thiazolinyl sulfide and a carrier therefor.

2,411,428 (Nov. 19, 1946; appl. May 31, 1940). AROMATIC SUBSTITUTED METHYL ALKYL ETHERS AS INSECTICIDES. Ingenuin Hechenbleikner, Stamford, Conn. American Cyanamid Company, New York, N. Y. A method of combatting insect pests includes exposing them to the action of a toxic amount of a composition containing as an essential active ingredient triphenylmethyl methyl ether.

2,411,720 (Nov. 26, 1946; appl. Oct. 9, 1944). INSECT REPELLENT. Samuel I. Gertler, Washington, D. C. Secretary of Agriculture. An insect repellent comprises about 60 parts of pyrethrum marc and about 2 parts of N, N-diethylpiperonylamide.

2,413,710 (Jan. 7, 1947; appl. Dec. 11, 1943). SPRAYING APPARATUS. John P. Jason, Chicago, Ill. Sprayer Corp. of America, Chicago, Ill.

2,413,803 (Jan. 7, 1947; appl. June 22, 1945.) 2-ETHYL-2-BUTYL PROPANEDIOL-1, 3. Samuel W. Tribit, Darien, Conn. U. S. Industrial Chemicals, Inc., New York, N. Y. This diol has been found to possess excellent insect-repellent properties. It repels **Aedes aegypti** for an average period of 226 minutes and also has a repellent effect with respect to **Anopheles quadri-maculatus.**

2,413,917 (Jan. 7, 1947; appl. Apr. 3, 1943). MERCAPTO NITRILES. Marion W. Harman, Nitro, W. Va. Monsanto Chemical Co., St. Louis, Mo. The patentee claims as new compounds beta-phenyl, beta-butyl, and beta-naphthyl mercapto propionitriles. The products are useful as insecticides.

2,414,592 (Jan. 21, 1947; appl. Oct. 1, 1945). WINDOW SCREEN AND VENTILATOR. Michael Garlinski, Thorold, Ontario, Canada.

2,414,640 (Jan. 21, 1947; appl. Oct. 9, 1941). WEED KILLER. Herbert G. M. Fischer, Westfield, N. J. Standard Oil Development Co. A composition adapted to penetrate the soil and to form a hard crust upon the surface of the soil when applied in the amount of about one-half gallon per square yard of soil comprises about equal parts of reduced cracking coal tar having a specific gravity of about 1.092 and a softening point of about 120° F., and a light petroleum distillate of aromatic character, the distillate having an initial boiling point of about 400° F., a final boiling point of about 570° F. and an A.P.I. gravity of about 21.3.

2,414,762 (Jan. 21, 1947; appl. Dec. 30, 1941). PROCESS FOR THE PRODUCTION OF ACRYLONITRILE. John J. Owen and Charles N. Kimberlin, Jr., Baton Rouge, La. Jasco, Inc. A process for the production of acrylonitrile consists in reacting anhydrous acetylene with anhydrous hydrocyanic acid gas at a temperature of from 850° F. to 1150° F. in the presence of potassium cyanide deposited on magnesium oxide, condensing the products of the reaction and recovering acrylonitrile.

2,415,020 (Jan 28, 1947; appl. Apr. 5, 1944). INSECTICIDAL COMPOSITIONS. Glen H. Morey, Terre Haute, Ind. Commercial Solvents Corp., Terre Haute, Ind. An insecticidal composition comprises a carrier liquid and from about 4 to 7 per cent by weight of bisdialkylaminobutene, selected from the group consisting of 1,4-bisdialkylamino-2-butenes and 3,4-bisdialkylamino-1-butenes in which the alkyl groups present therein contain from three to six carbon atoms.

2,415,047 (Jan. 28, 1947; appl. Aug. 4, 1945). INSECT-CONTROLLING COMPOSITIONS AND METHOD FOR CONTROLLING INSECTS THEREBY. Murray Senkus, Terre Haute, Ind. Commercial Solvents Corp., Terre Haute, Ind. An insect-controlling composition comprises 5-amino-1, 3-bis (1 methylheptyl)-5-methyl-hexahydro-pyrimidine and a carrier therefor.

2,415,627 (Feb. 11, 1947; appl. Aug. 17, 1945). MIXED DISULFIDES AND PROCESS FOR PREPARING THE SAME. Robert H. Cooper, Nitro, W. Va., Monsanto Chemical Company, St. Louis, Mo. A method of making a mixed disulfide comprises reacting benzothiazyl sulfur chloride with potassium ethyl xanthate. These are useful as insecticides.

2,415,662 (Feb. 11, 1947; appl. Oct. 6, 1943). DISSTILLATION OF ACRYLONITRILE FROM ACETONITRILE. John W. Teter and Walter J. Merwin, Chicage, Ill. Sinclair Refining Company, New York, N. Y. A process for separating acrylonitrile from mixtures containing both acrylonitrile and acetonitrile comprises fractionally distilling the mixture in the presence of water.

— Calendar of Meetings —

NPCA Convention - October 27, to 29, 1947, Bellevue Stratford Hotel, Philadelphia, Pa.

NAIDM's 34th Annual Meeting at Lord Baltimore Hotel, Baltimore, December 1-3, 1947.

Chemical Industries Exposition, Grand Central Palace, New York, December 1-6, 1947.

Charles Opitz

As the last forms of this issue were going to press we received word of the death of Charles Opitz, of John Opitz, Inc., Long Island City, N. Y. We regret very much to announce this. We do not have the complete details at this time, but these will appear in the August issue.

2,416,004 (Feb. 18, 1947; appl. April 28, 1942). INSECT CONTROL. Walter E. Hall, Wood River, Ill. Shell development Company, San Francisco, Calif. An insect control composition comprises a predominant amount of mineral spirits and containing from 1 per cent to 25 per cent of an unsaturated aliphate nitrile having from 16 to 20 carbon atoms (e.g. oleic nitrile).

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There are so many new faces in our membership that we felt it timely to refer to the fact that there may still be procured copies of this splendid book of humorous writings and comments . . . . unwittingly written . . . of an otherwise highly important science. The preparation of this book was done by Professor J. J. Davis, who has carefully compiled and selected much interesting material. This book may be purchased for $1.00 plus 10 cents in stamps to cover mailing postage. No PCO should be without this book in his library. Also order now before you forget—very simple to enclose a $1.00 bill and 10c in stamps.

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LOCAL ORGANIZATION NEWS

Cincinnati, Ohio

A luncheon meeting was held at Hotel Gibson, Cincinnati, Ohio on Friday, June 13th. Both President Harvey Sturgeon and Secretary William O. Buettner, of the National Pest Control Association were in attendance and spoke informally about many matters of industry interest including new chemicals and formulations, fly control, rodent control and organization affairs.

Among those present were:

Harvey Sturgeon, President, NPCA
William Phippard, Wilmar, Inc.
Robert L. Sikorski, Orkin Extg. Co.
R. M. Adams, Allen Chemical Co.
B. C. Scherzinger, Extermital Termite Co.
Robert C. Yeager, Rose Exterminating Co.
W. R. Watkins, Vogel-Ritt of Ohio, Inc.
R. H. Meyer, American Exterminators, Inc.
William O. Buettner, Sect'y NPCA

California

William O. Buettner, Secretary of the National Pest Control Association, is to make a much postponed trip to the West Coast arriving in Los Angeles, California on Sunday, July 27. On this visitation, the first since pre-war years, it is expected that "Bill" will crowd into his schedule as many meetings as possible.

Of major importance is a demonstration for Dry Wood Termites which will start on July 28th in Los Angeles and continue for approximately six days. Dr. Thos. E. Snyder of the Bureau of Entomology and Plant Quarantine is to be an observer and will participate in discussions about the project.

Following the visitation in Los Angeles, meetings will be held in San Francisco and Berkeley, August 4 and 5.

Definite dates for other meetings will be announced by the California Associations.

Arkansas PCO's Organized

May 31, was a happy and pleasant occasion when the Arkansas PCO's met at the Hotel Marion to form a state association

W. B. Hill of Hill-Smith Termite Control Co, Memphis, Tenn., discussed the subject of termite control. M. W. Smith, entomologist, Memphis, Tenn., described chlordane for use against roaches, and ants, "1080" and "Antu" for rats and mice and "DDT" for bedbugs.

H. O. Abel, President of the Texas Pest Control Association lent considerable assistance to the Arkansas PCO's in forming their association.

A splendid newspaper write-up appeared in the daily paper regarding the PCOs' meeting. We shall reprint one or two paragraphs that appeared in order that PCO's might appreciate the publicity given to the public and regard their responsibility as labeled 'at the customer's risk.'

"The Pied Piper has had his day. Modern Pest Control comes under the head of reputable organized business and any dealings with unrecognized services should be labeled 'at the customer's risk.'

"Organizations similar to the Arkansas Association have been completed in Texas, Ohio, Indiana, Louisiana, Missouri, New York and Canada. A group is in the process of organization in Oklahoma and associations have been formed in leading cities throughout the country.

"The purpose is protection of property-owning public, and promotion of modern and standardized services. It is hoped to educate the public in the value of using reputable operators, and to prevent 'fleecing' of the property owners by 'quacks.' "

The following were elected as officers of the association:
President, E. Allen Biddle, Blytheville, Ark.
Vice-President, J. H. Hewitt, Pine Bluff, Ark.

Sect'y. & Treas., Carl L. Whitson, Little Rock, Ark.

Board of Directors, Delton Mills, W. A. Black.

Connecticut Pest Control Assn.

On May 22nd the Connecticut Pest Control Association met at the Connecticut State Experimental Station in New Haven. 9 new members were voted in by the membership. This is the larget number of new members the organization has ever invested at one time.

Mr. Neeley Turner, Connecticut State Entomologist presided part of the evening, by giving a very interesting and constructive talk on building respect for the pest control operators through honesty in their advertising and work. An open discussion followed. A very interesting colored film of New England was shown by Esso Marketeers.

The new members that were taken into this organization are as follows: Mr. William Banta and W. J. Ghent, of the Merritt System, Milford, Conn., Francis J. Laverv, Laverv Exterminating Co., Hartford, Russell M. Beck, Ace Exterminating Co., Taftville, George and Grace Dyer, Rose Exterminating Co., Hartford, George Blum, Acme Pest Control Co., New Haven. Jack Kalison. Acme Pest Control Co., New Haven and Harold Levine, Keystone Exterminating Co., New Haven.

Points For Pigeons

Chicago—Pigeons flying around Chicago's Loop—and there are thousands—are steering clear of the North Western Railroad station when they want to take a rest.

On the station's ledges and window sills workmen are installing devices known as "pigeon repellants." They consist of upright u-shaped wire prongs which are fastened two inches apart on a wire frame.

Chief Engineer E. C. Vandenburgh said the devices cannot injure the pigeons. But, he added, they prevent the birds from sitting, in comfort on the ledges and sills.

PCO's Lament

The following lyrics were composed by John K. Medoff especially for the 1947 Installation Dinner of the New Jersey Pest Control Association. If John's lyrical effort brings to mind the Tit-Willow number from Gilbert & Sullivan's operetta, "The Mikado," he makes it quite clear that it is not only no coincidence but deliberate and intended that way.

On a cliff by the ocean, a PCO
  Moaned, "DDT, Velsicol, Antu"
And I said to him, "PCO, why do you sit
  Moaning, DDT, Velsicol, Antu"?
"Is it absence of bank balance, Buddy," I
  cried,
  "Or some Gessarol Jitters in your little
  inside?"
With a nod of his poor little head, he
  replied,
  "Oh, DDT, Velsicol, Antu."

He sat there forlorn as he stared into space
  Crying "DDT, Velsicol, Antu".
And the PCO's troubles they darkened his
  face
  "Oh, DDT, Velsicol, Antu."
"Is it keen competition that is making you
  fade,
  Or government agencies ent'ring
  your trade?"
And he wrung his two hands and a mumble
  he made,
  "Oh, DDT, Velsicol, Antu."

He beat on his chest, as he leaned on a
  bough,
  Groaning, "DDT, Velsicol, Antu".
And a cold perspiration bespangled his
  brow,
  "Oh, DDT, Velsicol, Antu."
He sobbed and he sighed, and a gurgle he
  gave,
  Then he plunged himself into the billowy
  wave,
And an echo arose from the suicide's grave,
  "Oh, DDT, Velsicol, Antu"

Now I feel just as sure as I'm sure that
  my name
  Isn't DDT, Velsicol, Antu.
That 'twas loss of his business that made
  him exclaim,
  "Oh, DDT, Velsicol, Antu"
But if he remained longer and decided to
  stay,
  And had to figure portal to portal back
  pay,
He would not have exclaimed as he jumped
  in the bay,
  "Oh, DDT, Velsicol, Antu"

Dead Rodents Annoy Firemen

Firemen at the central station on N. Market St., in San Jose, California said last night they will be glad to be rid of the rats which have plagued the building recently, but wish the City Health Department had chosen some other time than the start of the summer heat season to exterminate the rodents.

Poison placed between wall spaces in the fire station has been most successful in killing the rats—but the odor from the carcasses has made life unbearable in several portions of the dormitory and several crews have been obliged to temporarily move their sleeping quarters to another part of the building.

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WHAT'S NEW IN PEST CONTROL-PERSONALS

3 Days Conference to be Held On Application of Chemicals

Chemical welfare by air hopes to show as much scientific progress as chemical warfare by air this summer at Stillwater, Oklahoma. A three-day conference, first of its kind in the nation, will concern itself with latest experiments as well as proven commercial uses of airplanes for crop protection and other agricultural purposes.

Sponsored by Oklahoma A & M College, the event will be held August 7-9. Registration begins 9 a. m. Thursday, August 7, at Stillwater's North municipal airport. Dr. F. A. Fenton, professor and head of the entomology department at Oklahoma A & M, will be conference chairman.

Subjects to be covered include new chemicals for pest control, use of airplanes for dust application, use of airplanes for aerosol and spray applications, use of airplanes in scouting for crop damage and estimates, and use of helicopter as a means of applying chemicals. College faculty members will discuss types and adaptibilities of chemicals in use.

Experienced commercial operators from the south and southwest in the application by aircraft of insecticides, fungicides, weed-killers, seeds and fertilizers, will make aerial demonstrations on two different days of the conference. Planes and equipment will also be available for inspection.

The affair will be held in Stillwater during the second anual convention of the National Flying Farmers' Asso ciation, an organization which originated at Oklahoma A & M. Hundreds of farmers, airport operators, and agricultural air enthusiasts from throughout the country are expected to attend both the conference and the convention. Inquiries regarding the conference may be addressed to Doctor Fenton in in care of College. No registration fee for attending the conference. Housing and meals may be obtained on the campus at nominal charge.

Seen at the NAIDM meetings held in Chicago, Ill., June 9-10-11 were Professor J. J. Davis of Purdue University and Dr. George Wecker of the University of Illinois. 'Tis said that some new ideas were noted for PCO meetings.

Bill Buettner, Secretary of the National Pest Control Association, was also in attendance at the NAIDM meetings. Bill was seen in confab with several groups discussing matters of importance to PCO's.

The Cincinnati Health Department has issued a splendid bulletin being distributed to the people entitled "Rat Control is Each Individual's Responsibility". This bulletin describing suggestions also emphasizes "where experts are needed, hire a professional Pest Control Operator."

Comic Henny Youngman, doing a great job at the Copa, N. Y. Night Club, says he went golfing and broke 70. "Thats a lot of clubs to break," he says. He swung so wild that two field mice got scared ducking his swings. "Let's get on this fellow's golf ball," said one, "before we get killed."

Dr. C. B. Twinn Heads A Project

Recognizing how seriously swarms of biting insects are delaying the development of Canada's northland, the Dominion Department of Agriculture is this month sending an entomological task force to Baker Lake, Northwest Territories and Churchhill. There, at the invitation of Defence Research, the entomologists will study biting insects under field conditions and will test control materials and equipment.

The party will be headed by Dr. Cecil R. Twinn, author of numerous works relating to medical and veterinary entomology, and an authority on insect pests of man and animals. While denying the rumor that northern mosquitoes are as big as footballs, Dr. Twinn describes them as sufficiently plentiful and vicious to impede industrial development.

"In a section of Northern Quebec, lumbering operations were halted for a time last summer when men threw down their saws and axes to flee before the onslaught of mosquitoes and black flies", he says. Midges and moose flies will also be studied by the entomologists.

Their season's program will include the testing of fly-resistant clothing, insecticides, repellents and their rates and methods of application. In this, the entomologists will test a variety of spraying equipment: portable and motorized power sprayers, aerosol generators and airplanes. Mass attacks will be made on winged adult as well as on immature pests by the scientists who intend to experiment with a barrier of residual insecticides in an attempt to keep a whole area free of insects.

Dr. Twinn will be accompanied to Churchhill by J. F. Sharp and R. V. Fisher, Division of Entomology, Science Service, Dominion Department of Agriculture, and by Professor Hocking, Department of Entomology, University of Alberta.

Dr. Tom Freeman of the Dominion Department of Agriculture will be in charge of investigations at Baker Lake.

Ralph Morris

Mr. Morris, formerly sales representative on the Eastern Seaboard for John Powell & Co., has been placed in charge of a new company branch office in St. Louis, it was announced this month.

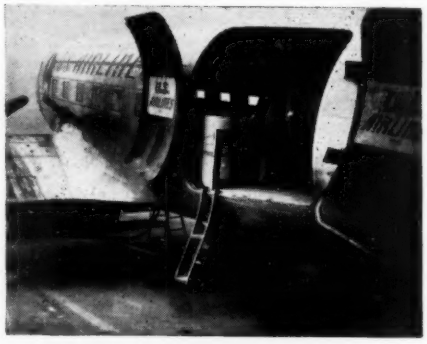
Mr. Morris, whose headquarters are at 1045 Paul Brown Building, will represent the Powell Company in the states south of St. Louis, including Alabama, Mississippi, Texas and Oklahoma.

The new office will give insecticide manufacturers better service and technical information in the St. Louis territory. Mr. Morris is a trained entomologist and will be happy to help solve insecticide problems in his area.

"1068" Bulletin and Chart

A bulletin with a chart describes the physical and chemical properties of "1068" and "DDT". This bulletin also reviews in part the history of the development of "1068", and discusses insecticidal properties and toxicological data of "1068" and its activation by the addition of Cook's Chemical Co. exclusive "Extane."

This bulletin and chart can be obtained by writing Cook Chemical Co., 2020 Wyandotte, Kansas City, Mo.



John Powell and Co.

Twin-engined DC-3's of the U. S. Airlines took off from Bendix Field, N. Y., on June 4, with 50,000 pounds of the new insecticide, Benzene Hexachloride, in response to an emergency request from the government of El Salvador to stem a locust plague that threatens to wipe out the country's coffee crop.

Working day and night to supply this emergency insecticide order, the plant of John Powell & Co., Inc., N. Y., manufacturers of basic insecticides, kept a steady stream of trucks shuttling between Brooklyn and the Bendix Airfield, near the George Washington Bridge, until the last DC-3 had taken off with its three-ton load of grasshopper death juice.

With the locust plague so critical that it was impossible to wait for ordinary means of transportation, the DC-3's were chartered to leave as soon as the deadly insecticide could be processed at the Powell plant and delivered to the airfield. The air shipment, the first of its kind ever made, went non-stop to Miami, Fla., and from there by TACA Aircraft to El Salvador.

Colorado Passes Insecticide Law

The State of California has passed a law regulating the sale of adulterated or misbranded insecticides, fungicides, rodenticides and economic poisons and devices.

The following leaflets are available from the Public Relations Department, Michigan State College, East Lansing, Michigan.:

Powder-Post Beetles: Their Control in Wood and Structural Timbers, By E. I. McDaniel, Article 29-41; May, 1947.

Pen Tests of Rabbit Repellents, by H. A. Cardinell and D. W. Hayne, Article 29-38; May, 1947.

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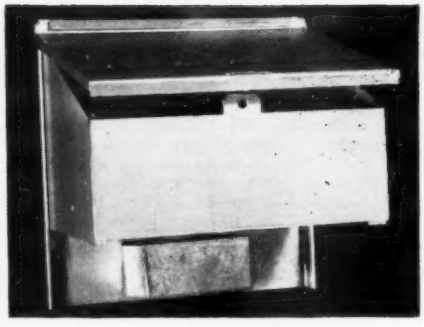

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Mistmaster Portable Electric Sprayers give perfect and complete penetration. In this patented sprayer, insecticides are first broken into minute particles by a rotary compressor, then warmed above room temperature, and finally, atomized completely by tremendous pressure at the nozzle.

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Writes George B. Lay

"Don B. Whelan and I have met and talked things over. He is in the Military Government, in insect and rodent control. I am the man in Corps for Korea in the same work. I have run into quite a few stateside boys whom I knew before, including Russell Fontaine, Medical Corps, who was is First Service Command Lab. at Jamaica Plain, Mass., a part of Boston, and whom I knew well there. I had a swell time in Honolulu with Ernie Forde. He showed me plenty.

"It has rained only one day here in Seoul. I will soon be tripping over other parts of Korea. I am really enjoying the work and the country, which is very strange but which you will get used to quickly."

We are glad to hear from you, George, and give our best wishes to the boys. George's address is Engineer Station Hqs. XXIV Corps, APO 235, c/o Postmaster, San Francisco, Calif.

Strategy Against Crows

Crows are notorious for pulling sweet corn. With the planting season almost here, the Connecticut Agricultural Experiment Station admits that they treat all sweet corn seed with a crow repellent. How much good this does is uncertain, for there is still loss.

Other suggestions are a crow fence made by stretching white string diagonally across the garden. It does help some, but the latest method reported is an old rubber hose cut into lengths of four to six feet and scattered about the garden. An experienced gardener says that the birds thus are deluded into thinking that snakes are present and therefore do not approach the corn patch.

D. H. Jenkins, N. Y. Times

75,000 Fewer Rats

Niagra Falls' (N. Y.) rat blitz has probably killed 75,000 to 100,000 rats, according to Warren H. Yeager, of the anti-rat drive committee. The Junior Chamber of Commerce distributed a mixture of oats, red meal, fish and rat poison, and residents spread more than 2,500 pounds of it around their premises on the night of May 3.

Get A Cat

Mice, with which in recent weeks the Australian state of Victoria has been plagued, have immobilized David Strachan, a farmer of Nandaly, because they have eaten through his wooden leg.

"Until I get a new leg from Melbourne," he said, "all I can do is sit in the house and watch them eat up the furniture. And they're doing that very effectively."

Federal Trade Commission

Stipulation (7599) (Insecticide)

The Federal Trade Commission accepted from Goulard & Olena, Inc., Skillman, N. J., a stipulation to discontinue representing that an insecticide spray designated "Go-Nex" is non-combustible, that it is the safest insecticide and that it will knock down insects instantaneously or kill them within 60 seconds.

FLY PROOFING

Technicians of CONTINENTAL CHEMISTE CORPORATION, Chicago, complete a major "Fly-Proofing" project at the Atlantic Hotel. George R. Chamlin and Harold Stern, shown in background, supervised the operation. Mr. E. R. Siefert manager of the Atlantic Hotel, said "I have not seen a fly in our premises since you fly-proofed it the first time a year ago."

Innis, Speiden New Larvacide Display

Conrad C. Johnson, Manager, Insecticide Division, Innis Speiden & Company, demonstrating new display for Larvacide dispenser package. These handy one pound dispenser bottles, each in a sealed can, have proved to be an ideal way to apply this powerful tear gas fumigant. Seated with Mr. Johnson is Rose G. Olivier, Insecticide Department.

Mosquitoes Like Color

A recent government test conducted in Oregon showed that white and yellow were the colors least attractive to mosquitoes; black, blue and red most attractive.

Julius Hyman & Co. Opens New Office

Julius Hyman & Co., manufacturers of OCTA-KLOR brand of Chlordane announce the opening July 1, 1947 of a Western Sales Office at 9 Main Street, San Francisco 5, California. Chlordane is the important new insect toxicant discovered by D. Julius Hyman. The San Francisco office has been located with a view toward giving improved sales and technical service to West Coast and export customers. The office is being directed by Mr. Edward Degginger who was formerly Assistant Sales Manager of the Rapid Mounting Corp., Chicago, Ill.

New Technical Sales Representative Appointed

Announcement is made by Julius Hyman & Company, manufacturers of Octa-Klor brand Chlordane, Denver, Colorado, of the appointment of Mr. Howard Rosenbaum as technical sales representative. Mr. Rosenbaum was formerly associated with Julius Hyman & Company as research chemist.

More Effective Insecticides

Sprout, Waldron & Co., Manufacturing Engineers of Industrial Processing Equipment, is pleased to announce the availability of a completely revised bulletin covering the Intimate Blending of dust insecticides and similar fine powder formulas.

The notable progress made during the past two years in this and other industries,

as well as many new indicated applications of this unusual method are indicated.

Write Sprout, Waldron & Company, Muncy, Pennsylvania for your copy of Bulletin I-846.

Fungicide for Backs of Rugs

Effective use of the fungicide G-4 for the preservation of the backs of rugs is reported by the Canadian Research Institute of Launderers and Cleaners. The institute investigated the severe deterioration of the cotton or jute backing as a result of mildew attack, which is frequent in the damp climate of British Columbia for use on the backs of rugs should be (1) a type which preferably can be applied from a dry solvent, and (2) nontoxic to humans and without deleterious effect on the dyes present in the rugs. Of the compounds studied, it was felt that 2,2'-dihydroxy-5,5'-dichlorodiphenylmethane, commonly called G-4, and developed by Givaudan-Delawanna, Inc., New York, N. Y., was satisfactory.

Plague of Mice

Australia was bothered with a plague of mice this month, hordes of the creatures swarming over 4,000 square miles of rich farm land in Northwest Victoria. The mice devoured wheat, ate at hay stacks, gnawed food, clothing, bedding, papers. Farmers said they had to tie the cuffs of their trousers to prevent the mice from running up their legs.

Mice are also troublesome in this country. The department of Agriculture has figured that mice and rats annually destroy money, food and other goods equal to the earnings of 200,000 men.

Once Idaho had to organize its stockmen against hordes of field mice over-running ranches on the upper Snake River. A few years ago the farmers of Kern County in California were also plagued by mice. The rodents increased so fast in the area around Taft, Fellows and Ford City that cats set loose to combat them instead turned tail and fled. Their onslaught was stopped by poisoned grain.

Poisoned grain was also used to end an infestation of mice on the Buena Vista Islands off California. There they ran as high as 4,000 to an acre and a federal biologist estimated they numbered 30,000,000 in all and figured it would cost $5,000,000 to eradicate them. The farmers at Klamath Falls in Oregon were more fortunate for they were helped, so the story goes, by clouds of gulls that sailed in from the coast and fed on the mice.

The damage that rodents do is caused largely by the bigger brother of the team, the rats. The Department of Agriculture has estimated that they cost the nation some $190,000,000 a year. It was thought that there are approximately as many rats in the United States as persons and half of them are on farms. Even so, the rat population is not so large as it used to be, because canned foods, modern refrigeration and structures of steel and concrete have made it harder for them to gnaw holes, get at food. However a certain county held a rat-killing contest. In six weeks there were piled up in front of the judges 153,720 rat tails. Human population of the county was only 35,000.

—Newark News

Onion Juice Aids Killing of Weeds

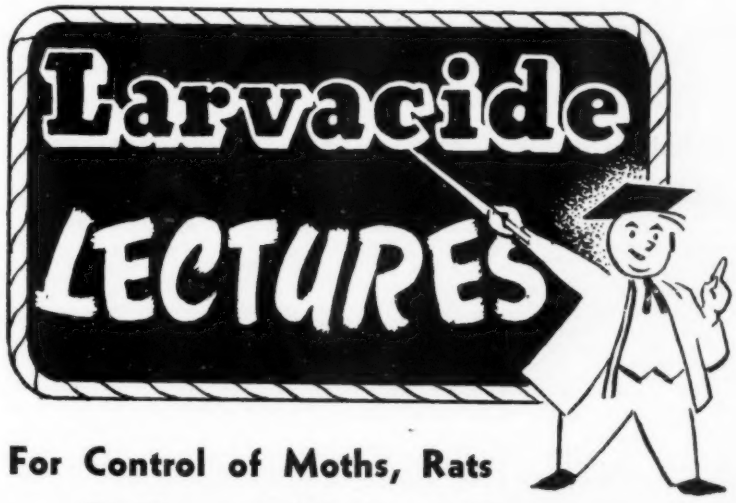
East Lansing, Mich.—Onion juice mixed with 2,4-D boosts the weed-killing capacity of the chemical from 10 to 20 fold. This is shown in experiments at Michigan State College here, carried out by Dr. E. H. Lucas and Dr. C. L. Hamner.

They mashed up onions and mixed the juice with distilled water in varying proportions, then disolved 2,4-D and sodium carbonate in the mixture. This was used on test plants, alongside of other test plants receiving "straight" 2,4-D solution. The 2.4-D with onion-juice addition proved many times more effective.

Proportions of 2,4-D to onion-juice were quite important, the experiment showed. Greatest effect was obtained when one part of onion-juice was dissolved in from 20 to 30 parts of water Both above and below the ratio the killing power diminished.

Curiously enough, no increase in killing power of the 2,4-D took place when garlic juice was substituted for onion juice, although garlic is a close botanical relative of onion. Tomato juice even caused a falling off in killing power.

The two experimenters state that they do not know yet why onion juice should have such an enhancing effect on 2,4-D, They are continuing their experiments. The onion juice won't smell up your yard, by the way.



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II. Plants as Housepests. Bacteria, Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

V. Backboned Animals. Chordata, coldblooded and warmblooded. Rodents, rats and mice take 56 pages. Formulae, Index. Pages: 148.

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Spray Chemicals and Application Equipment

The new book "Spray Chemicals and Application Equipment" is the result of six years research and collection of data by Wayne B. Fisher, B.S.A., Purdue University, chemical sales representative, and commercial horticulturist, cooperating with Dr. J. A. McClintock, Professor of Horticulture, Purdue University (co-author).

The book "Spray Chemicals and Application Equipment" is divided into two parts. Part one gives the interesting historical background of many chemicals and detailed discussions and photographs showing now they are manufactured. In addition, much discussion is devoted to methods of using spray chemicals, to insects and diseases controlled by the specific chemicals, and to methods of improving present day pest control practices.

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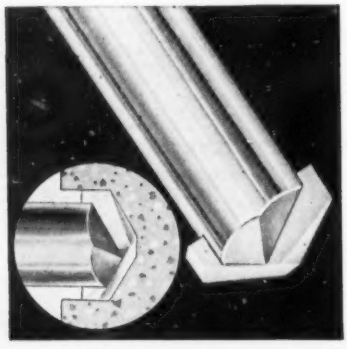

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Compete details are available in Leaflet 46-5, which may be obtained by writing Kennametal Inc., Dept P., Latrobe, Pa

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Old established exterminating, fumigating and termite control firm for sale, New York City and Westchester territory. Includes chemicals, equipment, contracts. Nets $15,000 yearly. Increased business assured. Price $25,000. Cash $17,500. Balance monthly. Only those interested in buying need apply. Write Box 25 Pests.

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For Sale, Exterminating business. Central United States. Very large territory. No competition. County seat, about 12,000. Unlimited possibilities. $5,500 required. Box 28 Pests.

Q.—What makes a **mosquito bite** itch? S.E.F.

A.—As the insect bites it leaves a tiny drop of formic acid which irritates the skin and causes the itch.

A Few Hints On How To Sell A Fumigation Job

The problems of a doctor and the problems of a pest control operator are very similar. Both are confronted by clients who, although seeking professional service and advice, oftimes do not wish to follow that advice. The clients realize that something must be done, but they have a feeling that surely there must be an easier answer to their problems. In cases like this it is the responsibility of both the doctor and the pest control operator to explain the situation in such a way that the client will understand that what is being prescribed is the best method of combatting whatever ills may exist. Call it public relations; call it salesmanship, or whatever you may, it is a very important phase of pest control.

When a doctor orders his patient to bed for a few days, he may encounter the same opposition that confronts a pest control operator when he recommends that a home or business establishment be fumigated. Immediately spirits droop, the patient gets a "hang-dog" expression on his face, and wonders why this horrible fate should happen to him. Right there is where the trouble starts. The trend of the conversation in the following few minutes may determine the extent of professional relationships for the next several years.

First, it must be remembered that when a person has just heard some news, which to him is unpleasant, he is in a rather unhappy frame of mind. Obviously, the next course of action would be to do something, or say something, that will cheer him up. If it's a man, and he doesn't like the idea of closing up for fumigation, you might remind him that it would be a wonderful opportunity to go fishing. If it's a woman, you might tell her it would be a good chance to get a day or two's rest from household chores. Some fumigators use the slogan: "Vacation Time is Fumigation Time". It's a very good one, for it associates the word "Fumigation" with something that is pleasant, and why not? In fumigating with HCN Discoids you are at one stroke, freeing a building of all insect and rodent infestation. Isn't that something worth being happy about?

A doctor, in order to gain the cooperation of his patient, will often explain to him the function of certain organs of the body, the disabilities which they can acquire, and how his treatments can remedy them. After a careful explanation it would be a very foolish patient who ignored his advice and doped himself up with the first patent medicine that he ran across. The same approach might be useful in acquainting clients with the benefits of fumigation. Tell them something about the life cycles and habits of insect pests. Explain to them the basic principles of fumigation.

Tell them how HCN gas reaches the pests no matter where they are; whether in clothing, bedding, furniture, carpets, drapes, or wherever else they might be. You know all these facts. If your client knows them too, and you are recommending a fumigation, he will be a more cooperative and satisfied customer.

These are just a few thoughts which we hope might be of benefit to you as the fumigation season approaches. As the pest control industry is gaining professional status it is increasingly important that public relations keep pace with technical development. As we said before, the problems of a doctor and the problems of a pest control operator are very similar.

— *Fumigation News*

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